

66222-134

02/09/2012

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

FEB 09 2012

Jennifer Yentel  
Makhteshim Agan of North America, Inc.  
4515 Falls of Neuse Road, Suite 300  
Raleigh, NC 27609

Subject: Application for Pesticide Notification (PRN 2007-4)  
Submission date: 1/04/2012  
Product Name: Thiophanate Methyl 4.5F  
EPA Reg. No.: 66222-134  
EPA Decision Number: 460014

Dear Ms. Yentel,

The Agency is in receipt of your Application for Pesticide Notification under Pesticide Registration Notice (PRN) 2007-4. The Registration Division (RD) has conducted a review of this request for its applicability under PRN 2007-4 and finds that the action(s) requested fall within the scope of PRN 2007-4.

The Agency acknowledges the revised container handling language.

The label submitted with the application has been stamped "Notification" and will be placed in our records. If you have questions concerning this letter, please contact Erin Malone at 703-347-0253 or via email at malone.erin@epa.gov.

Sincerely,

Shaja B. Joyner  
Product Manager 20  
Fungicide Branch  
Registration Division (7504P)



United States  
Environmental Protection Agency  
Washington, DC 20460

Registration  
 Amendment  
 Other

OPP Identifier Number  
FEB 09 2012

Application for Pesticide - Section I

1. Company/Product Number 66222-134	2. EPA Product Manager Shaja Joyner	3. Proposed Classification <input checked="" type="checkbox"/> None <input type="checkbox"/> Restricted
4. Company/Product (Name) Thiophanate Methyl 4.5F	PM# 20	
5. Name and Address of Applicant (Include ZIP Code) Makhteshim Agan of North America, Inc. 4515 Falls of Neuse Rd., Suite 300 Raleigh, NC 27609 <input type="checkbox"/> Check if this is a new address	6. Expedited Review. In accordance with FIFRA Section 3(c)(3) (b)(i), my product is similar or identical in composition and labeling to: EPA Reg. No. _____ Product Name _____	

Section - II

<input type="checkbox"/> Amendment - Explain below.	<input type="checkbox"/> Final printed labels in response to Agency letter dated _____
<input type="checkbox"/> Resubmission in response to Agency letter dated _____	<input type="checkbox"/> "Me Too" Application.
<input checked="" type="checkbox"/> Notification - Explain below.	<input type="checkbox"/> Other - Explain below.

**Explanation:** Use additional page(s) if necessary. (For section I and Section II.)  
Notification of addition of a state specific label restriction and correction of typographical errors. This notification is consistent with the provisions of PR Notice 98-10 and EPA regulations at 40 CFR 152.46, and no other changes have been made to the labeling or the confidential statement of formula of this product. I understand that it is a violation of 18 U.S.C. Sec. 1001 to willfully make false statements to EPA. I further understand that if this notification is not consistent with the terms of PR Notice 98-10 and 40 CFR 152.46, this product may be in violation of FIFRA and I may be subject to enforcement action and penalties under sections 12 and 14 of FIFRA.

Section - III

1. Material This Product Will Be Packaged In:				2. Type of Container	
Child-Resistant Packaging <input type="checkbox"/> Yes <input type="checkbox"/> No	Unit Packaging <input type="checkbox"/> Yes <input type="checkbox"/> No	Water Soluble Packaging <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Metal	<input type="checkbox"/> Plastic
				<input type="checkbox"/> Glass	<input type="checkbox"/> Paper
* Certification must be submitted		If "Yes" Unit Packaging wgt.	No. per container	Other (Specify) _____	
		If "Yes" Package wgt	No. per container		
3. Location of Net Contents Information <input type="checkbox"/> Label <input type="checkbox"/> Container		4. Size(s) Retail Container		5. Location of Label Directions <input type="checkbox"/>	
6. Manner in Which Label is Affixed to Product <input type="checkbox"/> Lithograph <input type="checkbox"/> Paper glued <input type="checkbox"/> Stenciled			<input type="checkbox"/> Other _____		

Section - IV

1. Contact Point (Complete items directly below for identification of individual to be contacted, if necessary, to process this application.)		
Name Jennifer Yentel	Title Regulatory Specialist	Telephone No. (Include Area Code) 919-256-9315
<b>Certification</b> I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.		6. Date Application Received (Stamped)
2. Signature 	3. Title Regulatory Specialist	
4. Typed Name Jennifer Yentel	5. Date 01/04/2012	



4/23

# THIOPHANATE METHYL 4.5 F

[Optional marketing language: "Contains thiophanate-methyl, the active ingredient used in Topsin 4.5FL  
Thiophanate methyl 4.5 F is not manufactured or distributed by Cerexagri."]

<b>ACTIVE INGREDIENT:</b>	<b>% BY WT.</b>
Thiophanate-methyl: (dimethyl[(1,2-phenylene)-bis(iminocarbonothioyl)]bis[carbamate]) .....	46.2%
<b>OTHER INGREDIENTS:</b> .....	<b>53.8%</b>
<b>TOTAL</b>	<b>100.0%</b>

Contains 4.5 pounds of thiophanate-methyl per gallon.

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

**NOTIFICATION  
FEB 09 2012**

**Manufactured for:**  
Makhteshim Agan of North America, Inc.  
4515 Falls of Neuse Rd., Suite 300  
Raleigh, NC 27609

EPA Reg. No. 66222-134

EPA Est. No. XXXXXXXXXX

**NET CONTENTS: XXXX GALS**

FIRST AID	
<b>IF SWALLOWED:</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<b>IF ON SKIN OR CLOTHING:</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF INHALED:</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth if possible.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF IN EYES:</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact ProSAR at 1-877-250-9291 for emergency medical treatment information.

**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMANS AND DOMESTIC ANIMALS  
CAUTION**

Harmful if swallowed, absorbed through skin, or inhaled. Avoid contact with skin, eyes, or clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water, after handling, and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Some materials that are chemical resistant to this product are barrier laminate, butyl rubber (≥ 14 mils), neoprene rubber (≥ 14 mils) and polyethylene. If you want more options, follow the instructions for category C on an EPA chemical resistance category selection chart.

**Handlers mixing, loading, and applying the product as a dip (including application of product in kaolinite clay to conifer seedling roots) must wear:**

- Coveralls over long-sleeved shirt and long pants

- Chemical-resistant gloves
- Chemical-resistant footwear plus socks
- A chemical-resistant apron

**All other mixers, loaders, and applicators must wear:**

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves
- Chemical-resistant apron for mixers, loaders, and other handlers exposed to the concentrate

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

**USER SAFETY RECOMMENDATIONS**

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE 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.

**ENGINEERING CONTROLS**

When handlers use enclosed cabs in a manner that meets the 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.

**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. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwater.

**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.

Do not apply when wind speed favors drift beyond the area intended for treatment.

**AGRICULTURAL USE REQUIREMENTS**

Use this product 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 intervals. 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). The REI for each crop is listed in the directions for use associated with each crop.

**Exemption:** If the product is applied by drenching, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated areas if there will be no contact with anything that has been treated.

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 over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear for overhead exposure

**NON-AGRICULTURAL USE REQUIREMENTS**

The requirements in this box apply to uses of this product that are not within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. Do not enter or allow others to enter until sprays have dried.

**PRODUCT INFORMATION**

Shake well before using.

Apply Thiophanate Methyl 4.5 F with ground or aerial equipment using sufficient volume of spray to provide thorough coverage. Add required amount of Thiophanate Methyl 4.5 F to partially filled tank agitated by mechanical or hydraulic means and then add remaining required amount of water. Continuous agitation is required to keep the material in suspension. Do not tank mix with highly alkaline pesticides such as Bordeaux mixture or lime sulfur. No claim of compatibility with other pesticides is implied. Use the higher rate under conditions of severe disease pressure. Also, see local State Extension Service instructions for application schedules.

Use the fl oz/acre rate for concentrate sprayers (less than 400 gallons on apples, less than 300 gallons on stone fruit). Use the fl oz/100 gal rate for dilute ground application. For aerial applications use a minimum of 5 gal/acre for row crops; use a minimum of 10 gal/acre for tree crops. For ground applications use a minimum of 20 gal/acre for row crops and 30 gal/acre for tree crops. Higher spray volume will result in better coverage and better disease control.

Chemigation instructions follow the **RESISTANCE MANAGEMENT** section of this labeling. Do not apply through any irrigation system unless these instructions are followed.

In California, chemigation is only allowed for the following crops: beans, cucurbits (cantaloupe, casaba, cucumbers, melons, pumpkins, squash, and watermelons), peanuts, soybeans, strawberries, and sugar beets.

When an adjuvant is to be used with this product, Makhteshim Agan of North America, Inc. suggests the use of a Chemical Producers and Distributors Association certified adjuvant.

**RESISTANCE MANAGEMENT**

To avoid the development of tolerant or resistant strains of fungi, tank mix Thiophanate Methyl 4.5 F with a fungicide of different chemistry and/or alternate a fungicide of different chemistry with Thiophanate Methyl 4.5 F at each application. **DO NOT USE PRODUCTS CONTAINING THIABENDAZOLE OR OTHER PRODUCTS CONTAINING THIOPHANATE METHYL IN COMBINATION OR IN ROTATION WITH THIOPHANATE METHYL 4.5 F.** If after using Thiophanate Methyl 4.5 F as directed and the treatment is not effective, a tolerant or resistant strain of fungi may be present. Discontinue the use of Thiophanate Methyl 4.5 F for at least one season. Do not use products containing thiabendazole as substitutes for Thiophanate Methyl 4.5 F, as they are of similar chemistry and will contribute to the development of resistance. As long as these precautions are followed, Thiophanate Methyl 4.5 F can be useful for disease control even if resistant strains are present.

**CHEMIGATION INSTRUCTIONS**

Apply this product only through sprinkler irrigation systems including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move, or drip (mini-micro sprinklers, strip tubing, trickle) irrigation systems. Do not apply this product through any other type of irrigation system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

If you have questions about calibration, contact Cooperative Extension Service specialists, equipment manufacturers, or other experts.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Do not connect the chemigation system to any public water system. Public water system means a system for the provision of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

**SYSTEM REQUIREMENTS**

Systems utilizing a pressurized water and pesticide injection system must meet the following requirement:

- The system must contain a functional check valve, vacuum relief valve, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the

system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump such as a positive displacement injection pump (e.g. diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

**INSTRUCTIONS FOR SPRINKLER (OVERHEAD) IRRIGATION, DRIP (TRICKLE) IRRIGATION**

Observe the requirements in the **SYSTEM REQUIREMENTS** section above. Do not apply when wind speed favors drift beyond the area intended for treatment.

Apply Thiophanate Methyl 4.5 F only through systems containing anti-siphon and check valves designed to prevent water source contamination or overflow of the mix tank and containing interlocking controls between the metering device and the water pump to ensure simultaneous shut off.

Maintain a gentle continuous agitation in mix tank during mixing and application to ensure a uniform suspension. Greater accuracy in calibration and distribution will be achieved by injecting a large volume of a more dilute suspension per unit time.

Application of more than the specified quantities of irrigation water per acre can result in decreased product performance.

Do not apply when wind speed favors drift, when system connections or fittings leak, when nozzles do not provide uniform distribution, or when lines containing the product cannot be flushed and must be dismantled and drained. In a center pivot system, block the nozzle set nearest the well/pivot/injection unit to prevent spray being applied to this area.

Where sprinkler distribution patterns do not overlap sufficiently, unacceptable disease control may result.

Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation water.

Apply Thiophanate Methyl 4.5 F in conjunction with chemically neutral liquid fertilizers. Avoid application in conjunction with highly alkaline fertilizers such as aqueous ammonia, as degradation of the pesticide could result in reduced performance.

Check local restrictions and requirements regarding sprinkler irrigation applications, as they vary from state to state.

**SPRAY PREPARATION**

Remove scale, pesticide residues, and other foreign matter from the chemical tank and entire injector system. Flush with clean water. Prepare a suspension of Thiophanate Methyl 4.5 F in a mix tank. Fill the tank with 1/2 or 3/4 the desired amount of water. Start mechanical or hydraulic agitation. Slowly add the required amount of Thiophanate Methyl 4.5 F and then the remaining volume of water.

**APPLICATION INSTRUCTIONS**

**Sprinkler Irrigation-Notes**

Observe all **SYSTEMS REQUIREMENTS** and **APPLICATION INSTRUCTIONS**. Set sprinkler system to deliver 0.4 inches of water per acre. Volumes of water higher than this could reduce efficacy. Start sprinkler and then uniformly inject the suspension of Thiophanate Methyl 4.5 F into the irrigation water line so as to deliver the desired rate per acre. Inject the suspension of Thiophanate Methyl 4.5 F with a positive displacement pump into the main line ahead of a right angle to ensure adequate mixing.

**NOTE:** When treatment with Thiophanate Methyl 4.5 F has been completed, do not irrigate the treated area for 24 to 48 hours to prevent washing the chemical off the crop.

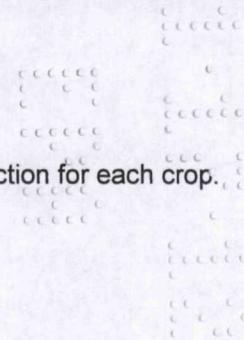
**Drip (Mini-Micro Sprinklers, Strip Tubing, Trickle) Irrigation-Notes**

Observe all **SYSTEM REQUIREMENTS** and **APPLICATION INSTRUCTIONS**.

**Preharvest Interval (PHI)**

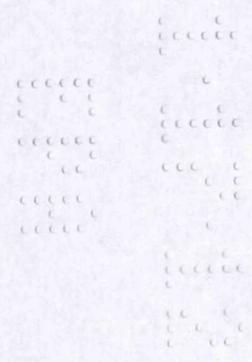
The required days between last application and harvest are given in the **REMARKS** section for each crop.

REI = Restricted-Entry Interval



APPLICATION RATES

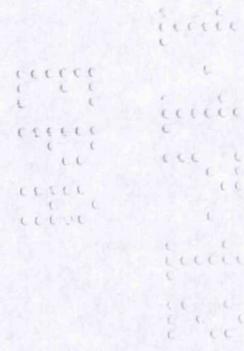
CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
ALMONDS	Brown Rot Blossom Blight ( <i>Monilinia</i> ) Scab ( <i>Cladosporium</i> sp.) Jacket Rot ( <i>Monilinia</i> , <i>Sclerotinia</i> , <i>Botrytis</i> ) Leaf Blight ( <i>Seimatosporium</i> )	20 - 30	---	Apply at early pink bud and early petal fall. Apply at pink bud for Brown Rot control. For all other applications Thiophanate Methyl 4.5 F can be applied with a contact fungicide like Ziram 76F for broad-spectrum control and resistance management.
<ul style="list-style-type: none"> <li>• Do not apply more than 30 fl oz of product per acre per application</li> <li>• Do not apply more than 60 fl oz of product per acre per season</li> <li>• The PHI is 1 day.</li> <li>• The REI is 3 days</li> </ul>				
APPLES	Apple Scab ( <i>Venturia</i> ) Black pox* ( <i>Helminthosporium papulosum</i> ) Flyspeck ( <i>Zygophiala</i> sp.) Powdery Mildew ( <i>Podosphaera</i> sp.) Sooty Blotch ( <i>Gloeodes</i> ) Black Rot ( <i>Botryosphaeria obtusa</i> ) Brooks fruit spot ( <i>Mycosphaerella</i> sp.) White rot* ( <i>Botryosphaeria</i> sp.)	15-20 (except CA)  30 (CA only)	3.75-5  7.5	Apply at 5- to 10-day intervals from green tip through petal fall; continue at 7- to 14-day intervals as cover sprays.
<p>*Not registered for use in California</p> <ul style="list-style-type: none"> <li>• Do not apply more than 80 fl oz of product per acre per year total including both applications beginning at petal fall and preharvest applications to control post-harvest diseases.</li> <li>• The PHI is 1 day.</li> <li>• The REI is 2 days</li> </ul>				



<b>APPLES</b> <i>(continued)</i>	<b>Preharvest use to control Post-Harvest Diseases on Apples</b>			
	Storage Rot Blue Mold ( <i>Penicillium expansum</i> ) Gray Mold ( <i>Botrytis cinerea</i> ) Bulls-Eye Rot ( <i>Neofabraea</i> spp.)	1	3.75-5	Apply as a pre-harvest spray within 2 weeks to 3 days of harvest. Application closer to harvest provides better efficacy. Application of a non-benzimidazole post-harvest fungicide such as Penbotec® or Schlor® will provide additional protection from post-harvest diseases.
<ul style="list-style-type: none"> <li>Do not apply more than 80 fl oz of product per acre per year total including both applications beginning at petal fall and preharvest applications to control post-harvest diseases.</li> <li>Do not use a benzimidazole fungicide such as Mertect® post-harvest following a pre-harvest application of Thiophanate Methyl 4.5 F.</li> <li>The PHI is 1 day.</li> <li>The REI is 2 days.</li> </ul>				

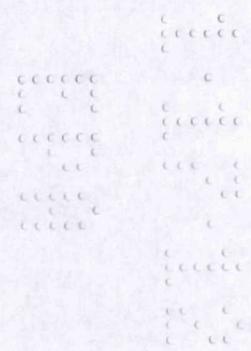
CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
<b>BEANS</b> (Dry and Succulent) including: Lima bean, Snap bean, Kidney bean, Mung bean, Navy bean, Pinto bean, Wax bean, Broad bean, Fava bean, Asparagus bean, Blackeyed pea, Cowpea, Sweet lupine, White lupine, White Sweet lupine, Grain lupine, Chick pea, Garbanzo bean	Gray Mold ( <i>Botrytis</i> ) White Mold ( <i>Sclerotinia</i> ) Anthracnose ( <i>Colletotrichum</i> )	30-40	---	For one application: Apply when 100% of plants have at least one open bloom or when conditions are favorable for disease development.
		<b>OR</b> 20-30 Use a maximum of 80 fl oz of product per acre (2.8 lbs a.i.) per crop cycle, with a minimum 7-day spray interval.		<b>OR</b> For multiple applications: Make first application when 10%-30% of plants have at least one open bloom, and follow with sequential applications on a 4- to 7-day interval.
<ul style="list-style-type: none"> <li>Do not apply more than 80 fl oz/acre of product per year.</li> <li>The REI is 1 day for all succulent beans and 3 days for dry beans.</li> <li>The PHI is <b>14</b> days for succulent beans and lima beans.</li> <li>PHI is <b>28</b> days for dry beans.</li> </ul> <p><b>For California Only:</b></p> <ul style="list-style-type: none"> <li>PHI is <b>14</b> days for succulent beans.</li> <li>PHI is <b>28</b> days for dry beans and lima beans.</li> </ul>				

CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/100 GAL	REMARKS
<b>CUCURBITS:</b> Cantaloupe, Casaba Cucumbers, Melons, Pumpkins, Summer and winter squash, Watermelons	Acremonium/ Cephalosporium Hypocotyl rot	10	---	Apply in-furrow, on top of the seeds at planting. Do not use less than 10 gallons of water per acre.
	Anthracnose* <i>(Colletotrichum)</i> Gummy Stem Blight* <i>(Didymella)</i> Powdery Mildew <i>(Erysiphe)</i> Target Spot* <i>(Corynespora)</i>	10	---	Begin applications when plants begin to run or when disease first appears and repeat at 7- to 14-day intervals as needed.  For Target Spot, use 7-day intervals as needed.
	Belly Rots* <i>(Rhizoctonia, Fusarium)</i>	10	---	For Belly Rots, apply in sufficient volume to allow runoff to the soil. Will not control <i>Pythium</i> or <i>Phytophthora</i> .
	Suppression of vine decline <i>(Monosporascus)</i> Charcoal rot <i>(Macrophomina)</i>	10	---	Apply through buried drip irrigation (chemigation) to the root zone. For disease suppression, apply at 14-day intervals beginning at emergence and continuing to harvest. Applications weekly or biweekly, beginning 4-6 weeks prior to harvest, will also offer suppression but may not be as effective as a season-long program.
	<p>*Not registered for use in California</p> <ul style="list-style-type: none"> <li>• Do not apply more than 60 fl oz product (2 lbs a.i.) per acre per season*from any combination of application timings</li> <li>• Thiophanate Methyl 4.5 F can be tank mixed with mancozeb or chlorothalonil for additional disease control and resistance management.</li> <li>• Follow resistance management guidelines under <b>DIRECTIONS FOR USE.</b></li> <li>• The PHI is 1 day.</li> <li>• The REI is 1 day.</li> </ul>			



CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
GARLIC (Clove treatment)	Penicillium Clove rot	---	20	<p>Completely immerse garlic cloves in suspension for at least five minutes. Continuously agitate the solution tank by hydraulic or mechanical means.</p> <p>After treatment, remove cloves from solution and drain over sand. Dry cloves after treatment and prior to planting.</p>
<ul style="list-style-type: none"> <li>The PHI is 0 days.</li> </ul>				
ONIONS* GARLIC (IN-FURROW)	White rot ( <i>Sclerotinia cepivorum</i> )	40 broadcast	---	<p>Apply Thiophanate Methyl 4.5 F by spraying directly into the open furrow at the time of planting seed, sets, or bulbs.</p>
<p>*Not registered for use in California</p> <ul style="list-style-type: none"> <li>Not for this use through any type of irrigation system.</li> <li>Do not apply more than 40 fl oz/acre Thiophanate Methyl 4.5 F per year.</li> <li>The PHI is 0 days.</li> <li>The REI is 3 days.</li> </ul>				
PEANUTS	Early Leaf Spot ( <i>Cercospora</i> ) Late Leaf Spot ( <i>Cercosporidium</i> ) Rust ( <i>Puccinia</i> ) Limb rot ( <i>Rhizoctonia</i> ) Web blotch ( <i>Ascochyta</i> )	10	---	<p>Begin applications when disease first appears and repeat at 14-day intervals, as needed.</p>
<ul style="list-style-type: none"> <li>Do not use Thiophanate Methyl 4.5 F alone. Use only in combination with another non-benzimidazole fungicide such as mancozeb at 1.5 lbs/acre or chlorothalonil. Follow resistance management guidelines under <b>DIRECTIONS FOR USE.</b></li> <li>Do not apply more than 40 fl oz/acre of Thionphanate Methyl 4.5 F per year.</li> <li>The PHI is 14 days.</li> <li>The REI is 1 day.</li> </ul>				
PECANS	Brown Spot ( <i>Cercospora</i> ) Downy Spot ( <i>Mycosphaerella</i> ) Liver Spot ( <i>Gnomonia</i> ) Powdery Mildew ( <i>Microsphaera</i> ) Scab ( <i>Fusicladium</i> ) Stem end blight ( <i>Botryosphaeria</i> sp.) Zonate leaf spot ( <i>Cristulariella</i> sp.)	20	---	<p>Begin applications when first leaves are showing and repeat at 3- to 4-week intervals until shuck split. Do not spray after shuck split.</p>
<ul style="list-style-type: none"> <li>Do not apply more than 60 fl oz/acre of Thiophanate Methyl 4.5 F per season.</li> <li>Follow resistance management guidelines under <b>DIRECTIONS FOR USE.</b></li> <li>The PHI is 1 days.</li> <li>The REI is 3 days.</li> </ul>				

CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
PISTACHIOS	Shoot blight ( <i>Botrytis</i> , <i>Botryosphaeria</i> )	30-40	---	Apply at bloom. Apply in a minimum of 100 gallons per acre by ground or 20 gallons per acre by air. For aerial application, fly over every row or center.
	<ul style="list-style-type: none"> <li>• Do not apply more than 40 fl oz/acre of Thiophanate Methyl 4.5 F per season.</li> <li>• The PHI is 0 days.</li> <li>• The REI is 3 days.</li> </ul>			
POTATOES	White mold ( <i>Sclerotinia</i> sp.)	20-30	---	Make first application just prior to row closure to full bloom of the primary flower clusters, prior to petal drop, followed by a second application 14 days later, and at 14-day intervals if conditions for disease development are favorable. Thorough coverage of the flowers, stems and branches is essential for disease control. Apply prior to the development of disease for best results. May be tank mixed with other fungicides labeled for early and late blight control. Makhteshim Agan of North America, Inc. does not recommend aerial application for control of this disease on this crop.
	<ul style="list-style-type: none"> <li>• Do not apply more than 80 fl oz/acre of Thiophanate Methyl 4.5 F per season.</li> <li>• The PHI is 21 days.</li> <li>• The REI is 2 days.</li> </ul>			



CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
SOYBEANS	Anthracnose <i>(Colletotrichum)</i> Brown Spot <i>(Septoria)</i> Frog-eye Leaf Spot <i>(Cercospora)</i> Stem and Pod Blight <i>(Diaporthe,</i> <i>Phomopsis)</i> Purple Seed Stain <i>(Cercospora)</i>	10- 20		Apply from full bloom when pods are 1/8-1/4 inch in length. Make a second application 14 to 21 days later. Do not make the second application later than 14 days after pods average 1/4 inch in length or when beans form in the pod. Use the high rate under severe disease pressure.
		20	---	FOR SEED BEANS ONLY: For seed quality, make a single application at the high rate when beans form in the pod.
	White mold <i>(Sclerotinia )</i>	15-20	----	Make one application at early bloom (R-1 to R-2 stage) followed by a second application 14 days later if conditions are favorable for continued disease pressure. Thorough coverage of the flowers, stems and branches is essential for disease control. Use a minimum of 5 gallons of water per acre by air.
Aerial blight (suppression)	20	---	Make initial application when disease threatens (before visual symptoms appear) and repeat 14-21 days later if needed. Applications later than 14 days after pods average 1/4 inch in length are prohibited.	
<ul style="list-style-type: none"> <li>• Do not apply more than 40 fl oz/acre of Thiophanate Methyl 4.5 F per year.</li> <li>• Do not make more than 2 applications per year.</li> <li>• Do not graze or feed treated vines or hay to livestock.</li> <li>• The PHI is 21 days.</li> <li>• The REI is 1 day.</li> </ul>				

CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
<b>STONE FRUITS:</b> <b>Apricots</b>	Brown Rot Blossom Blight Fruit Brown Rot ( <i>Monilinia</i> )	20-30 (use 30 in California)	6.7-10	Apply at early bloom (red bud). Make a second application at full bloom. If needed under severe disease pressure, apply additional sprays at 10- to 14-day intervals between full bloom and final preharvest spray.
<b>Cherries:</b> <b>Sweet and Sour</b>	Brown Rot Blossom blight Fruit Brown Rot ( <i>Monilinia</i> )	20-30 (use 30 in California)	6.7-10	Apply at early bloom (early popcorn). Make a second application at full bloom. If needed under severe disease pressure, apply additional sprays at 10- to 14-day intervals between full bloom and final preharvest spray.
	Cherry leaf spot ( <i>Coccomyces</i> )	22.5-30	7.5-10	Apply at petal fall or before, when leaves first unfold, and at first, second and third cover sprays at 10- to 14-day intervals and one spray 14 to 21 days after harvest.
	Powdery Mildew ( <i>Podosphaera</i> and <i>Sphaerotheca</i> )	20-30 (use 30 in California) <b>PLUS</b> 22.5-30	6.7-10  <b>PLUS</b> 7.5-10	Apply at early bloom (early popcorn). Make a second application at full bloom. <b>PLUS</b> Apply at shuck fall and first cover.
<b>Nectarines</b>	Brown Rot Blossom Blight Fruit Brown Rot ( <i>Monilinia</i> )	20-30 (use 30 in California)	6.7-10	Apply at early bloom (pink bud). Make a second application at full bloom if conditions favor disease development. If needed under severe disease pressure, apply additional sprays at 10- to 14-day intervals between full bloom and final pre-harvest sprays.
<b>Peaches</b>	Brown Rot Blossom Blight Fruit Brown Rot ( <i>Monilinia</i> )	20-30 (use 30 in California)	6.7-10	Apply at early bloom (pink bud). Make a second application at full bloom if conditions favor disease development. If needed under severe disease pressure, apply additional sprays at 10- to 14-day intervals between full bloom and final preharvest sprays.

<b>Peaches</b> <i>(continued)</i>	Peach Scab <i>(Cladosporium)</i>	20-30 (use 30 in California)  <b>PLUS</b> 22.5-30	6.7-10  <b>PLUS</b> 7.5 -10	Apply at early bloom (pink bud). Make a second application at full bloom if conditions favor disease development.  <b>PLUS</b> Apply at shuck split and at first cover spray.
<b>Plums and Prunes</b>	Brown Rot Blossom Blight Fruit Brown Rot <i>(Monilinia)</i>	20-30 (use 30 in California)	6.7-10	Apply at early bloom (green tip). Make a second application at full bloom. If needed under severe disease pressure, apply additional sprays at 10- to 14-day intervals between full bloom and final preharvest sprays.
	Black knot <i>(Dibotryon)</i>	20-30 (use 30 in California)	6.7-10	Apply at pre-bloom, petal fall, and at first, second, and third cover spray at 10- to-14-day intervals.
	Leaf spot <i>(Coccomyces)</i>	20-30 (use 30 in California)	6.7-10	Apply at petal fall, shuck, and at first, second, and third cover sprays at 10- to 14-day intervals and 1 spray 14 to 21 days after harvest.
	<ul style="list-style-type: none"> <li>• Do not apply more than 80 fl oz/acre of Thiophanate Methyl 4.5 F per year</li> <li>• Follow resistance management guidelines under <b>DIRECTIONS FOR USE.</b></li> <li>• The PHI is 1 day.</li> <li>• The REI is 2 days.</li> </ul>			

CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
<b>STRAWBER- RIES</b>	Suppression only: Crown Rot* <i>(Colletotrichum</i> <i>spp.)</i>	15-20	---	Begin applications after establishment of the transplants and continue through first bloom at 10- to 14-day intervals. Use the higher rate if the fields have a history of <i>Colletotrichum</i> crown rot and/or conditions are favorable for development of the disease. Will not control <i>Phytophthora</i> species.
	Fruit rot <i>(Botrytis)</i> Leaf blight <i>(Dendrophoma)</i> Leaf scorch <i>(Diplocarpon)</i> Powdery mildew <i>(Sphaerotheca)</i>	15-20	---	Begin applications at early bloom and continue at 7- to 10-day intervals. Use higher rate under conditions of severe disease pressure.
<p>*Not registered for use in California.</p> <ul style="list-style-type: none"> <li>• Do not apply more than 80 fl oz of this product per acre per year.</li> <li>• Follow resistance management guidelines under <b>DIRECTIONS FOR USE.</b></li> <li>• The PHI is 1 day.</li> <li>• The REI is 1 day.</li> </ul>				

CROP	DISEASES	FL OZ/ACRE/ APPLICATION	FL OZ/ 100 GAL	REMARKS
SUGARBEET	Cercospora leaf spot ( <i>Cercospora</i> )	10-20 (use 10 in California)	---	Apply when conditions become favorable for disease development before the disease appears and follow with a non-benzimidazole fungicide within 14 days of application or as needed. Tank mix Thiophanate Methyl 4.5 F with a protectant fungicide such as mancozeb or triphenyltin hydroxide when resistant strains of <i>Cercospora</i> are present in the field. For areas east of the Rocky Mountains: Do not make more than one application of Thiophanate Methyl 4.5 F per season for Cercospora Leaf Spot.
	Powdery mildew ( <i>Erysiphe</i> sp.)	10-20 (use 10 in California)	---	Apply as soon as disease symptoms appear and follow with a non-benzimidazole fungicide at a 14-day interval or as needed. Thiophanate Methyl 4.5 F can be tank mixed with sulfur products such as Microthiol® Dispers® at 5 to 10 lbs/acre for additional disease control and resistance management.
<ul style="list-style-type: none"> <li>• Do not apply more than 60 fl oz/acre of Thiophanate Methyl 4.5 F per year.</li> <li>• Follow resistance management guidelines under <b>DIRECTIONS FOR USE</b>.</li> <li>• The PHI is 21 days.</li> <li>• The REI is 1 day.</li> </ul>				
TRITICALE AND FALL SEEDED WHEAT Idaho, Oregon, and Washington only	Foot Rot Strawbreaker Eye Spot ( <i>Pseudocercospora</i> sp.)	20	---	Apply Thiophanate Methyl 4.5 F at the rate indicated in a single application by air or ground after wheat is tillered but before stem elongation has begun. Use sufficient water to obtain thorough coverage.
	<ul style="list-style-type: none"> <li>• Do not apply more than 20 fl oz/acre of Thiophanate Methyl 4.5 F per year.</li> <li>• Do not cut for hay within 90 days of application.</li> <li>• Do not allow livestock to graze in treated areas before harvest.</li> <li>• The PHI is 90 days.</li> <li>• The REI is 1 day.</li> </ul>			

**FOR USE ON CONIFERS**  
**(Not for use in California)**

CROP	DISEASES	MAXIMUM APPLICABLE RATE PER ACRE	RATE, MINIMUM GALLONAGE	REMARKS
<b>CONIFERS</b> <b>Pine</b> Austrian Red Scots Christmas Trees	Tip blight ( <i>Diplodia</i> )	60 fl oz	20 fl oz product per acre applied in spray solution at a rate of 100 gallons of spray per acre	Apply at bud break. Repeat 10 to 14 days later, just before needles emerge from sheath; repeat again 10 to 14 days after needle emergence.
<b>Fir</b> Douglas	Swiss needle cast ( <i>Phaenocarpa</i> ) Rhabdocline needle cast	100 fl oz	20 fl oz product per acre applied in spray solution at a rate of 50 gallons of spray per acre	Apply initially in early May. Repeat at 4-week intervals.
<ul style="list-style-type: none"> <li>• <b>Pine:</b> Do not apply more than 60 fl oz/acre of Thiophanate Methyl 4.5 F per year.</li> <li>• <b>Fir:</b> Do not apply more than 100 fl oz/acre of Thiophanate Methyl 4.5 F per year.</li> <li>• Add a spreader-sticker to improve coverage.</li> <li>• Use minimum gallonage with mist-blower types of sprayers and higher gallonage with conventional sprayers.</li> <li>• Do not graze livestock in treated areas.</li> <li>• The REI is 12 hours.</li> </ul>				
<b>CONIFERS</b> (Seedling treatment) <b>Longleaf</b>	Brown needle blight ( <i>Scirrhia</i> )	---	1.25 fl oz per 9.5 oz of dry kaolinite clay for seedling roots	Wet seedling roots in clean water, then apply Thiophanate Methyl 4.5 F / kaolinite mixture to wet roots.
<b>Loblolly</b> <b>Longleaf</b> <b>Slash</b>	Fusarium and Rhizoctonia root rot	---	2 fl oz / 50 oz kaolinite clay, plus enough water to make a slurry	Thoroughly cover seedling roots with Thiophanate Methyl 4.5 F / kaolinite slurry.
<ul style="list-style-type: none"> <li>• Do not apply mixture to seedling foliage.</li> <li>• During treatment, avoid excessive drying of roots or exposure to temperatures greater than 90° or less than 32°F.</li> <li>• Thiophanate Methyl 4.5 F does not control <i>Pythium</i> or <i>Phytophthora</i>.</li> <li>• The REI is 12 hours.</li> </ul>				



**HORTICULTURAL APPLICATIONS  
GREENHOUSE, NURSERY, AND LANDSCAPE  
REI-12 hours**

Thiophanate Methyl 4.5 F provides broad-spectrum control of many foliar, stem, and below-ground diseases on a wide range of horticultural plants grown or maintained under a variety of conditions. Apply Thiophanate Methyl 4.5 F 14 to 21 days prior to when a particular disease usually appears and at the very latest, upon first sign of disease. Use 7- to 14-day spray intervals with 14 days being for preventive treatments and the 7-day interval for times when conditions are conducive to disease development. Add an acceptable wetting agent to the spray tank to increase product efficacy for hard-to-wet foliage. Use a spreader-sticker when excessive and repeated foliar wetting occurs. Use Thiophanate Methyl 4.5 F to control listed diseases on non-commercial fruit and nut trees. Do not use fruit or nuts from trees treated with this product as food. Do not apply this product to home orchards or backyard fruit trees after fruit set.

**Note:** Thiophanate Methyl 4.5 F has been determined to be safe for use on the plant types listed in these directions for use based on cumulative data derived from research trials and historical field use. As all species and cultivars have not been tested, perform trial applications if a user wishes to make an application to a plant type not listed on the label but found on a similar use site and for disease that is listed on the label. To conduct a trial application, apply at least two applications to at least 25 trial plants at the highest concentration, 7 days apart. Evaluate 7 days after the last application before initiating full-scale application. Do not use this product on the following plants: Swedish Ivy (*Nephrolepis exaltata*), Boston Fern (*Plectranthus australis*), and Easter Cactus (*Hatiora gaertneri*).

PLANT TYPE	SUCH AS BUT NOT LIMITED TO:
Herbaceous Bedding	Ageratum, Begonia, Canna, Coleus, Dahlia, Dusty Miller, Foxglove, Fuchsia, Geranium, Impatiens, Lavender, Marigold, Pansy, Petunia, Pinks, Primrose, Salvia, Statice, Strawflower, Tickseed, Verbena
Flowering	Chrysanthemum, Hydrangea, Hollyhock, Iris, Lily, Poinsettia
Tropical Foliage	Dieffenbachia, Dracaena, English Ivy, Philodendron, Pothos
Woody Ornamentals	Azalea, Hibiscus, Holly, Ligustrum, Rhodendrum, Rose, Pyracantha
Evergreen Trees	Douglas Fir, Fir, Larch, Pine, Spruce
Deciduous Trees*	Ash, London Plane, Maple, Oak, Sycamore, Walnut
Flowering Trees*	Cherry, Crabapple, Hawthorn, Mountain Ash, Pear

\*Do not use fruit or nuts from treated trees as food or feed.

**FOLIAR SPRAY  
PLANT TYPES AND DISEASES CONTROLLED**

DISEASE(S)	PLANT TYPES
Anthraxnose	Woody ornamentals, shade trees <sup>1</sup>
Ascochyta Blight	Herbaceous ornamentals
Black spot	Roses
Botrytris (Gray Mold)	Woody and herbaceous ornamentals
Brown Rot	Woody and herbaceous ornamentals
Colletotrichum	Woody and herbaceous ornamentals
Cercospora Leaf Spot	Woody and herbaceous ornamentals
Corynespora Leaf Spot	Ligustrum
Didymellina Leaf Spot	Iris
Diplodia Tip Blight ( <i>Diplodia pinea</i> )	Shade and ornamental trees
Ovulinia	Azalea, rhododendron <sup>2</sup>
Entomosporium Leaf Spot	Woody and herbaceous ornamentals
Fusicaladium Leaf Scab	Woody and herbaceous ornamentals
Phomopsis Blight	Woody and herbaceous ornamentals
Pine Tip Blights	Woody ornamentals

**FOLIAR SPRAY  
PLANT TYPES AND DISEASES CONTROLLED  
(Continued)**

DISEASE(S)	PLANT TYPES
Powdery Mildew	Woody and herbaceous ornamentals, ornamental nut and fruit trees

Rust Diseases	Ornamental nut and fruit trees
Ramularia Leaf Spot	Herbaceous ornamentals
Scab	Pyracantha, flowering crab, ornamental fruit and nut trees
Septoria Leaf Spot	Woody and herbaceous ornamentals
Venturia Leaf Scab	Woody and herbaceous ornamentals

<sup>1</sup> Begin at bud and make 2 or 3 additional applications at 10- to 14-day intervals.

<sup>2</sup> Begin treatment as flowers open. Addition of a spray surfactant to the spray mixture improves distribution of the spray on hard-to-wet plants such as roses.

**FOLIAR SPRAY APPLICATIONS**

**APPLICATION RESTRICTIONS**

**Maximum Single Application Rates:**

**Ornamentals:** Do not exceed the maximum single application rate of 85.3 oz Thiophanate Methyl 4.5 F per acre (3.0 lbs thiophanate-methyl active ingredient per acre).

**Cut Flowers:** Do not exceed the maximum single application rate of 14.2 oz Thiophanate Methyl 4.5 F per acre (0.5 lb thiophanate-methyl active ingredient per acre).

**Seasonal Maximum Application:**

**All Ornamentals:** Do not apply more than 66.6 gallons Thiophanate Methyl 4.5 F (300 lbs thiophanate methyl active ingredient per acre per season).

**Hydraulic Application Mixing Instructions**

Add the required amount of Thiophanate Methyl 4.5 F to a partially filled spray tank agitated by mechanical or hydraulic means and then add the remaining volume of water. Maintain continuous agitation to keep the material in suspension and apply with properly calibrated spray equipment.

**Application Concentrations (Mechanical or Hand-Held):**

Use the labeled amount of Thiophanate Methyl 4.5 F per 100 gallons of water for the prevention and control of the diseases shown below.

**FOLIAR DISEASES**

DISEASE(S) CONTROLLED	CONCENTRATION OF THIOPHANATE METHYL 4.5 F FL OZ/100 GALS	REMARKS
Anthracoese ( <i>Colletotrichum</i> )	10.75-20	Apply as buds break or at first sign of disease. Repeat application at 7- to 14-day intervals as needed during disease period.
Black Spot of Rose ( <i>Diplocarpon rosae</i> )	10.75-20	Apply early summer or at first sign of disease. Repeat application every 7 to 14 days as needed during disease period.
Brown Rot and Blight ( <i>Monlinia, Sclerotina, Whetzellinia</i> )	10.75-20	Apply late spring or at first sign of disease. Repeat application every 7 to 14 days as needed during the disease period.

**FOLIAR DISEASES (Continued)**

DISEASE(S) CONTROLLED	CONCENTRATION OF THIOPHANATE METHYL 4.5 F FL OZ/100 GALS	REMARKS
Fusicladium and Venturia Leaf Scabs on: Crabapple, Hawthorn, Pear, Mountain Ash, Pyracantha, etc.	10.75-20	Apply as buds break. Repeat application every 7 to 14 days during disease period. Effective control requires coverage during expansion. Rotations with chlorothalonil or propiconazole can be utilized.
Leaf Spots and Blights caused by: <i>Ascochyta, Blumeriella, Botrytis, Cercospora, Coccoomyces, Corynespora, Curvularia, Didymellina, Entomosporium,</i>	10.75-20 (10-14.5; California Only)	Make applications when disease symptoms first appear. Repeat every 7 to 14 days during disease period. Rotations with chlorothalonil can be used.

<i>Fabraea, Fusarium, Ramularia, Rhizoctonia, Marssoninia, Mycosphaerella, Myrothecium, Phoma, Physalasporea, Schizothyrium, Septoria, Sphaceloma</i>		
Ovulinia Blight	7.25-20	Apply as flowers open. Repeat every 7 to 14 days during disease period.
Powdery Mildews <i>Erysiphe, Microsphaera, Phyllactinia, Podosphaera, Oidium, Sphaerotheca</i>	10-20	Apply when disease first appears and repeat application every 7 to 14 days. Rotations with other effective products can be used.
Rust Diseases caused by: <i>Puccinia, Gymnosporangium, Uromyces</i>	10.75-20	Apply late spring or when symptoms first appear. Repeat applications every 7 to 14 days during disease period. Rotations with other effective products can be used.
Tip Blight of Pine <i>Sphaeropsis sapinea, Diplodia pinea</i>	14.5-20	Begin applications in the spring when new growth starts. Make a second application just prior to needle emergence from the sheath and a third application 7 days later. Ensure thorough coverage.
Twig Blights, Cankers, and Diebacks <i>Diaporthe, Kabatina, Phoma, Phomopsis</i>	14.5-20	Apply when symptoms first appear. Repeat applications every 7 to 14 days during disease period.

**Adjuvants:** Where rainfall and/or overhead irrigation is the norm, use of a compatible spreader/sticker is suggested. Where wetting of foliage is difficult, use a compatible wetting agent. Follow the phytotoxicity precautions described in the **HORTICULTURAL APPLICATIONS** section of this label.

**SOIL DRENCH APPLICATIONS**

**Mixing Instructions:** Add required amount of Thiophanate Methyl 4.5 F to a partially filled tank agitated by mechanical or hydraulic means. Add the remaining required amount of water. Maintain continuous agitation throughout application to keep the material in suspension.

**Application Concentrations/Rates and Timing for Disease Control:** Create a drench solution by mixing 7.5 to 20 fl oz of Thiophanate Methyl 4.5F per 100 gallons of water. Apply as a drench or heavy spray at the rate of 0.5 to 2 pints per square foot (100 gallons per 400 to 1600 square feet). For small pots and shallow flats up to 4 inches in size, apply at 1 pint per square foot. For containers and pots 4 inches or larger, refer to the following table for the volume to apply. Make repeat applications at 4- to 8- week intervals depending on disease presence and conditions for disease development.

Container Type	Drench Solution Volume to Apply/Container	
	1 pt/ sq ft Rate	2 pt/sq ft Rate
4 inch	2 fl oz	---
5 inch	2.5 fl oz	---
6 inch	---	6.5 fl oz
7 inch	---	3.5 fl oz
8 inch	---	11 fl oz
9 inch	---	14 fl oz
10 inch	---	17.5 fl oz

For containers larger than 10 inches, a drench volume of 2½ to 3 pints per square foot of surface area is required.

**Plant Types:** Containerized woody shrubs, trees, herbaceous/bedding, flowering, and tropical foliage plants and flowers and bedding plants in the landscape.

**Note:** Do not apply this product to plug trays or seedling flats at time of seeding.

**Soil Diseases Controlled:** *Botrytis, Cylindrocladium, Fusarium, Gliocladium, Myrothecium, Penicillium, Ramularia, Rhizoctonia, Sclerotinia, and Thielaviopsis.*

**Note:** *Pythium, Phytophthora* and *Cylindrocladium spathiphylli* are not controlled by Thiophanate Methyl 4.5 F.

**PLANT DIP TREATMENT**

**Mixing Instructions:** Mix as described in the **FOLIAR DISEASES** and **SOIL DRENCH APPLICATIONS** sections of this label. Maintain continuous agitation during application.

**Application Concentration and Dipping Time**

**Plants or Cuttings:** Use 14.5 to 20 fl oz of Thiophanate Methyl 4.5 F per 100 gallons of water. Immerse plants or cuttings for 10 to 15 minutes, remove, and allow to drain and dry. Note that the **PERSONAL PROTECTIVE EQUIPMENT** section of this label included protective clothing for dip treatment.

**Bulbs, Corms, Tubers, and Rhizomes:** Use 14.5 to 20 fl oz of Thiophanate Methyl 4.5F per 100 gallons of water or two teaspoons of Thiophanate Methyl 4.5 F per gallon of water. Soak cleaned bulbs for 15 to 30 minutes in warm dip (80-85° F) within 48 hours of digging. Dry bulbs after treatment. If bulbs are for forcing, treat bulbs that have been heat cured.

**Plant Types:** Plants, cuttings, cane sections of woody herbaceous, flowering and tropical foliage plants. Bulbs, corms, tubers, and rhizomes of plants such as but not limited to Caladium, Easter Lily, Tulip, Gladiolus, Daffodil, Iris.

**Diseases Controlled:** *Botrytis, Cythrodcladium, Fusarium, Gliocladium, Myrothecium, Penicilium, Ramularia, Rhizoctonia, Sclerotinia, and Thielaviopsis.*

**TURF APPLICATIONS**

Use Thiophanate Methyl 4.5 F against certain foliar and soil diseases for use on all turf types such as golf course greens, tees and fairways, athletic fields, cemeteries, parks, and commercial and home lawns. Use Thiophanate Methyl 4.5 F both preventatively and curatively; it is not phytotoxic on turfgrass. Do not use Thiophanate Methyl 4.5 F on turf being grown for sale or other commercial uses such as sod.

For use only by certified applicators and those under their direct supervision. Do not apply with fixed wing or rotary aircraft.

**Mixing Instructions:** Add the required amount of Thiophanate Methyl 4.5 F to a partially filled tank agitated by mechanical or hydraulic means. Add the remaining required amount of water. Maintain continuous agitation to keep the material in suspension. For best results, use spray mixture the same day it is prepared.

**Turf Types:** All cool season and warm season grasses (such as but not limited to Bentgrasses, Bermudagrasses, Bluegrasses, Fescues, Ryegrasses, St. Augustinegrasses and Zoysiagrasses) or their mixtures.

DISEASE(S) CONTROLLED	RATE OF THIOPHANATE METHYL 4.5 F FL OZ/1000 SQ FT *	REMARKS
Anthracnose ( <i>Colletotrichum graminicola</i> )	2-3.5  (3.5-5.3)**	Apply when disease first appears. Make additional applications at 14-day intervals as needed. Allow spray to dry on leaves with no watering in.
Dollar Spot ( <i>Sclerotinia homoeocarpa</i> ) Copper Spot ( <i>Gloeocercospora sorghi</i> ) Brown Patch and Zoysia Patch ( <i>Rhizoctonia solani</i> ) Red Thread ( <i>Laetisaria fuciformis</i> )	2-3.5	Apply when disease first appears. Make additional applications at 14-day intervals as needed. Allow spray to dry on leaves with no watering in.
Pink Snow Mold ( <i>Microdochium nivale</i> ) (Only for those areas where snow cover is not present the entire winter)	2-3.5	Apply Thiophanate Methyl 4.5 F in middle to late November before turf has stopped all growth activity. Lightly water application into the root zone for best results. For best results, use a spreader-sticker. Let second spray dry on leaf surfaces with no watering in. Minimum spray interval is 14 days.
Gray Leaf Spot ( <i>Pyricularia grisea</i> )	3.5-5.3	Apply when conditions are favorable for disease development. Continue at 14-day intervals. Let spray dry on leaves with no watering in.

Summer Patch ( <i>Magnaporthe poae</i> )	3.5-5.3	For preventative treatment, make 3 applications at 21-day intervals beginning in early May. Water product into the root zone thoroughly after application. For suppression, apply two applications at 14-day intervals, beginning applications when the disease first appears.
Fusarium Blight ( <i>Fusarium roseum</i> ) Necrotic Ring Spot and Spring Dead Spot ( <i>Leptosphaeria korrae</i> )	3.5-5.3	Make two applications at 14-day intervals beginning applications when the disease first appears.
Stripe Smut ( <i>Ustilago striiformis</i> )	3.5-5.3	Make two applications at 14-day intervals when disease first appears. Water into root zone after application. For prevention, apply in the spring (just before grass begins growth) and in the fall.

\*Refer to the use sites and maximum application rates table to determine allowable rates for each application.

\*\*Use the 3.5 - 5.3 fl oz rate for curative response to Basal Stem Anthracnose.

**Turf Application Directions**

Apply Thiophanate Methyl 4.5 F uniformly over the area to be treated with a properly calibrated power sprayer. Apply after mowing or avoid mowing for 12 hours after application. Apply sufficient water to obtain thorough coverage; usually 1½ to 2½ gallons per 1000 sq ft of turf area. When treating golf course greens, always treat aprons and approaches to golf greens.

SITE	MAXIMUM SINGLE APPLICATION RATE PER FL OZ/1000 SQ FT	MAXIMUM SEASONAL APPLICATION RATE FL OZ/1000 SQ FT
Golf course green/tees/aprons	5.3	14.25
Golf Course Fairways (Except Florida)	3.5	3.5
Golf Course Fairways (Florida only)	1.75	1.75
Residential and Public areas (home lawns, parks, athletic fields, schools, day care centers)	1.75	7

**Note to User:** Do not graze animals on treated turf. Do not feed clippings to livestock or poultry.

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal or cleaning of equipment.

**PESTICIDE STORAGE:** Store in original container in dry area. Do not store in a manner where cross-contamination with other pesticides, fertilizers, food or feed could occur. If spilled during storage or handling, absorb with sand or other inert material and dispose of absorbent in accordance with the Pesticide Disposal instructions listed below.

**PESTICIDE DISPOSAL:** Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be used according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**CONTAINER HANDLING:**

**Nonrefillable Container (five gallons or less):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. 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 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a 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. If recycling is not available, 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.

**Nonrefillable Container (greater than five gallons):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the

