

Front Cover

CAVALIER™ F

TURF AND ORNAMENTAL SYSTEMIC FUNGICIDE

For the prevention and control of turf diseases and the diseases of annual and perennial flowers, bedding plants, foliage plants, ground covers, plus deciduous and evergreen trees and shrubs.

ACTIVE INGREDIENT:

Thiophanate-methyl (dimethyl 4,4'-o-phenylenebis[3-thioallophanate]) 41.25%

OTHER INGREDIENTS 58.75%

TOTAL 100.00%

This product contains 4.0 lb thiophanate-methyl per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID	
● IF INHALED:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
● IF ON SKIN OR CLOTHING:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
● IF IN EYES:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
● IF SWALLOWED:	Call 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 the poison control center or doctor. Do not give anything by mouth to an unconscious person.
● Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. For 24-Hour Emergency Assistance Call Chemtrec 1-800-424-9300.	

EPA Reg. No. 1001-69
 EPA Est. No. 70815-GA-1
 CLEARY CHEMICAL CORPORATION
 178 RIDGE ROAD
 DAYTON, NJ 08810-1501



NET CONTENTS: 2.5 Gallons

Effective Date: 10/02/05
 Accepted Date: 05/17/04
 Replaces: 08/99

EMERGENCY PHONE NUMBERS:
 M-F 9AM-5PM ET
 800-524-1662 • 732-329-8399
 24 Hour CHEMTREC
 800-424-9300

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed, absorbed through the skin or inhaled. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling.

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 C on an EPA chemical resistance selection chart.

- **WPS Uses:** Applicators and other handlers who handle this pesticide for any use covered by the Worker Protection Standard, 40 CFR Part 170, must wear: long sleeve shirt and long pants, chemical resistant gloves (such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride (PVC) ≥ 14 mils, or Viton ≥ 14 mils) and shoes with socks.

- **For exposures in enclosed areas:** a respirator with either an organic vapor-removing cartridge with a NIOSH approved organic vapor (OV) cartridge or canister with any N, R, P or HE filters.

- **NON-WPS Uses:** Applicators and other handlers who handle this pesticide for any use NOT covered by the Worker Protection Standard, 40 CFR Part 170, should wear: long-sleeved shirt and long pants, and shoes with socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS: 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 outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water by disposal of equipment washwaters. Do not apply, allow to drift, or drain or flush equipment onto non-target areas.

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. Exemption: If the product is applied by drenching, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area 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, chemical resistant gloves, (such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride (PVC) ≥ 14 mils, or Viton ≥ 14 mils), and shoes plus socks.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box only apply to uses of this product that are NOT within the scope of the Worker Protection Standard 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.

Turf and Landscape Uses: Keep children and pets out of treated areas until sprays have dried.

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.

STORAGE AND DISPOSAL

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

Pesticide Storage: Store in the original container in a dry, temperature controlled 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, contain/re-capture spillage and dispose of in accordance with the Pesticide Disposal instructions listed below.

Pesticide Disposal: Wastes resulting from the use of this product are toxic and may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Do not re-use empty container. Triple rinse (or equivalent), then offer for recycling or reconditioning, 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.

GENERAL INFORMATION

Cavalier F is a broad spectrum fungicide exhibiting preventative, curative, and systemic properties. It is useful on a wide variety of turf and ornamental disease problems. Apply Cavalier F with ground or overhead equipment, using sufficient volume of spray to provide thorough coverage. Do not apply with fixed wing or rotary aircraft. Use the higher rates under conditions of severe disease pressure. Also, see local State Extension Service recommendations for application schedules. This product is not for homeowner use and can only be used by individuals/firms licensed or registered by the state to apply ornamental or turf pest control products. Chemigation instructions follow "Directions For Use". Read and follow these instructions carefully for this method of application.

Resistance Management: To avoid the development of tolerant strains of fungi, Cavalier F should be used with fungicides of different modes of action. Cleary Chemical does not recommend the use of products containing thiabendazole in combination or rotation with Cavalier F. These utilize similar chemistry and mode of action and can contribute to development of disease tolerance. If, after using Cavalier F as recommended, and the treatment is not effective, a tolerant strain of fungi may be present. Consult your local Cleary Chemical representative, your State Agricultural Experiment Station, or your State Cooperative Extension Service for proper disease identification and advice on the prompt use of some other suitable fungicide or disease control strategy. As long as recommended precautions are followed, Cavalier F can remain useful for disease control.

Mixing Instructions: SHAKE WELL BEFORE USING. Some settling may occur during prolonged periods of non-use. High pH environments cause a shortened tank life for diluted product. The buffering of tank water to pH 6-7 prior to the addition of Cavalier F is recommended. Add required amount of Cavalier F to partially filled tank (1/2 total volume), agitate by mechanical or hydraulic means, add tank mix product if used (**Do not tank mix Cavalier F with copper-containing materials or with highly alkaline pesticides, such as Bordeaux mixture or lime sulfur.** For more information, see 'Tank mixing instructions' below), agitate again and then add remaining required amount of water. Continuous agitation is recommended to keep the material in proper suspension. For best results, use spray mixture the same day it is prepared.

Tank Mixing Instructions: Cavalier F is compatible with most commonly used pesticides. If tank mixing with other materials, add products in the following order: water soluble bags, wettable powders, dry flowables, liquid flowables, emulsifiable concentrates, and soluble materials such as fertilizers. No claim of compatibility with other products is implied. **Do not tank mix with copper-containing materials or with highly alkaline pesticides, such as Bordeaux mixture or lime sulfur.** Consult the intended tank mix partner product label for appropriate application rates and use instructions. Follow the label directions for the most restrictive of label precautions and limitations. This product cannot be mixed with any product containing a label prohibition against such mixing. Read and observe the most restrictive precautionary statements and other information appearing on product labels used in mixtures. Cavalier F may be applied in conjunction with chemically neutral liquid fertilizers. Application in conjunction with highly alkaline fertilizers, such as aqueous ammonia, may cause a degradation of the pesticide, resulting in reduced performance and should be avoided.

CHEMIGATION

GENERIC REQUIREMENTS

1. Apply this product only through the following types of systems: sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, solid set, or hand move; flood (basin); or drip trickle irrigation systems. Do not apply this product through any other type of irrigation system.
2. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.
3. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.
4. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
5. 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.

SPECIFIC REQUIREMENTS

1. Public water system means a system for the provision to the public 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.
2. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back towards the injection pump.
4. The pesticide injection pipeline must 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 drawn from the supply tank when the irrigation system is either automatically or manually shut down.
5. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. 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.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.

NON SPECIFIC REQUIREMENTS

1. Remove scale, pesticide residue, and other foreign matter from the chemical tank and entire injector system. Flush with clean water.
2. Prepare a suspension of product in the mix tank or stock bucket. Fill the tank with 1/2 or 3/4 of the desired amount of water. Start agitation and add the required amount of product to the solution along with the remaining volume of water.
3. Maintain a gentle agitation in the mix tank during application to assure a uniform suspension. Follow mixing instructions and tank mixing instructions previously indicated.
4. Start system and then uniformly inject the suspension of Cavalier F into the irrigation line so as to deliver the desired rate per acre. Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation system.
5. Greater accuracy in calibration and distribution will be achieved by injecting a larger volume of a more dilute suspension per unit time.
6. The suspension of Cavalier F should be injected with a positive displacement pump into the main line ahead of a right angle turn to ensure adequate mixing.

SPRINKLER (OVERHEAD) CHEMIGATION

Observe all instructions in the Generic, Specific and Non-Specific requirements sections above and the following additional requirements:

1. 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.
2. 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.

Set sprinkler system to deliver 1/10 to 1/4 inches of water per acre. Volumes of water higher than this may reduce efficacy. Application of more than recommended quantities of irrigation water per acre may result in decreased product performance. Where sprinkler distribution patterns do not overlap sufficiently, unacceptable disease control may result.

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

FLOOD (BASIN) CHEMIGATION

1. Systems using a gravity flow pesticide dispensing system must meter the pesticide into the water at the head of the field and down stream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential for water source contamination from backflow if water flow stops.
2. Systems utilizing a pressurized water and pesticide injection system must meet the following requirements: Observe all instructions in the Generic, Specific and Non-Specific requirements sections above and items 1 and 2 of the sprinkler irrigation requirements.

DRIP (TRICKLE) CHEMIGATION

Observe all instructions in the Generic, Specific and Non-Specific requirements sections above.

TURF APPLICATIONS

Cavalier F may be used on all fine turf applications such as Commercial, Residential and Public (such as home lawns, parks, athletic fields, schools, and day care centers), and Golf Courses (greens, tees, fairways and aprons) of cool and warm season grasses such as Bentgrass, Bluegrass, Bermudagrass, Fescue, Ryegrass, St. Augustinegrass, Zoysiagrass, or their mixtures. Cavalier F is not phytotoxic to any of the above mentioned grasses when used in accordance with the label. Cavalier F is to be used for the prevention and control of the diseases mentioned below. It has both preventative and curative activity. Do not graze animals on treated turf. Do not feed clippings to livestock or poultry. Not for use on turf being grown for sale or other commercial use as sod.

Application Instructions: Apply material with properly calibrated hand held, mechanical or motorized spray equipment or by chemigation through appropriate sprinkler irrigation systems. Spray uniformly over the area to be treated. Apply recommended amounts in sufficient water to obtain thorough coverage of treatment area (2-4 gal per 1,000 sq ft is suggested). When treating golf greens, always treat aprons. Use the highest recommended rate under conditions of severe disease pressure. For best results, apply after mowing or avoid mowing twelve hours after application. For root pathogens, lightly water the treatment area to move the fungicide into the active root zone with one to two tenths inch of water. Excessive irrigation may move application below active root zone and reduce application effectiveness. Green design and drainage will influence irrigation practices. When tank mixing with contact action fungicides for foliar diseases, applications should be allowed to dry on leaf surfaces. Normal watering may proceed after sprays have dried.

Table 1:

Maximum Individual Application Rates and Minimum Re-Treatment Intervals

Do not exceed the amounts per acre or reduce the re-treatment interval indicated below.

Use Site	Maximum application rate of Rate of Cavalier F	Minimum Re-Treatment Interval	Comments
Residential or Public Areas	0.68 Gallons/Acre (2 oz / 1,000 sq.ft.)	14 days	
Golf Course Tees Greens, Aprons	2.04 Gallons/Acre (6 oz / 1,000 sq.ft.)	14 days	
Golf Course Fairways— except Florida	1.36 Gallons/Acre (4 oz / 1,000 sq.ft.)	14 days	Excludes Florida
Golf Course Fairways— Florida Only	0.68 Gallons/Acre (2 oz / 1,000 sq.ft.)	14 days	Florida Only One Application per year

Table 2: Maximum Seasonal Application Rates

Do not exceed the following amounts of product per Acre per season

Use Site	Maximum Gallons Rate of Cavalier F per Acre per Season	Fluid Ounces Cavalier F per 1,000 sq. ft.	Comments
Residential or Public Areas	2.72 Gallons	8 fl.oz.	4 Applications per year
Golf Course Tees Greens, Aprons	5.44 Gallons	16 fl. oz.	
Golf Course Fairways— except Florida	1.36 Gallons	4 fl.oz.	Excludes Florida
Golf Course Fairways— Florida Only	0.68 Gallons	2 fl.oz.	Florida Only

Table 3: Turf Disease Control

Disease(s) Controlled	Rate of Cavalier F fl oz/1,000 sq ft	Remarks*
Anthracnose, basal <i>Colletotrichum graminicola</i>	4-6	For prevention in historic areas of disease pressure, apply twice at 14 day intervals when soil temperature reaches 60°F. For curative control, apply when disease first appears and continue at 14 day intervals. Rotations and/or tank mix combinations with chlorothalonil or triadimefon can be utilized.
Anthracnose, foliar <i>Colletotrichum graminicola</i>	2-4	
Bermudagrass Decline <i>Gaeumannomyces graminis</i> var. <i>graminis</i>	4-6	Apply in mid-July or when disease symptoms first appear and repeat at 14 day intervals for suppression. Use higher rates under most severe disease expression. Water treatment into active root zone. Follow proper agronomic recommendations to maintain plant vigor.
Take-All Patch <i>Gaeumannomyces graminis</i> var. <i>avenae</i>		
Cool Season Brown Patch <i>Rhizoctonia cerealis</i>	4-6	For prevention, apply in fall before turf has stopped all growth activity. Apply second application in early spring when soil temperatures reach 55-60°F or when disease first appears. For curative action, apply when disease first appears in early spring and continue at 14 day intervals. Water treatment into active root zone.
Necrotic Ring Spot <i>Leptosphaeria korrea</i>		
Spring Dead Spot <i>Leptosphaeria korrea</i>		
Coprinus Snow Mold <i>Coprinus psychromorbidus</i>	4-6	Apply 2 treatments at 21 day intervals in late fall to early winter, with the last application made just prior to first permanent snow cover. Rotations and/or tank mix combinations with PCNB can be utilized.

Disease(s) Controlled	Rate of Cavalier F fl oz/1,000 sq ft	Remarks
Dollar Spot <i>Moellerodiscus, Lanzia, Sclerotinia</i> Large Brown Patch <i>Rhizoctonia solani</i> Ascochyta Leaf Blight <i>Ascochyta</i> Copper Spot <i>Gloeocercospora sorghi</i> Fusarium Patch <i>Fusarium nivale</i> Red Thread <i>Laetisaria fuciformis</i> Zoysia Patch <i>Rhizoctonia solani</i>	2-4	Apply when disease first appears and continue at 14 day intervals. Rotations and/or tank mix combinations with chlorothalonil, iprodione, or mancozeb (Protect™) can be utilized.
Fusarium Blight <i>Fusarium roseum, F. triticum</i>	4-6	Apply when disease first appears at 14 day intervals.
Gray Leaf Spot (Blast) <i>Pyricularia grisea</i>	4-6	Apply preventative application before expected period of disease development. Continue applications at 14 day intervals.
Leaf Spot <i>Drechslera</i> Leaf, Crown, and Root Diseases <i>Bipolaris, Curvularia, Exserohilum</i>	4-6	Apply when disease first appears and make applications at 14 day intervals as needed. Rotations and/or tank mix combinations with chlorothalonil, iprodione, or mancozeb (Protect™) are recommended under severe conditions.
Pink Snow Mold <i>Microdochium nivale</i>	2-4	Apply in late fall to early winter before turf has stopped all growth activity. A second application may be used in combination with chlorothalonil, PCNB, or thiram (Spotrete™) at recommended rates before snow cover or during spring thaw.
Rusts <i>Puccinia, Uromyces</i>	4-6	Apply at 14 day intervals when disease first appears. Rotations and/or tank mix combinations with chlorothalonil or mancozeb (Protect™) are recommended.
Stripe Smut <i>Ustilago striiformis</i>	4-6	Apply at 14 day intervals when disease first appears. For prevention, apply in spring and fall.

Disease(s) Controlled	Rate of Cavalier F fl oz/1,000 sq ft	Remarks
Summer Patch <i>Magnaporthe poae</i>	4-6	For prevention, apply 3 applications starting late April or early May using 21 day intervals. Rotations and/or tank mix combinations may be used as part of the three application program. For suppression, apply at 14 day intervals when disease first appears. Water treatment into active root zone.
Bentgrass Dead Spot <i>Ophiosphaerella agrostis</i>	4-6	For prevention, apply in early June or based upon local Extension Service recommendations. Apply at 14 day intervals. Rotations and/or tank mix combinations may be used for season long disease prevention.

*Observe the maximum individual application rates and maximal seasonal applications limits in Table 2.

HORTICULTURAL APPLICATIONS

NURSERY, GREENHOUSE, LANDSCAPE & INTERIORSCAPE

Annual and Perennial Flowers, Bedding Plants, Foliage Plants, Ground Covers, plus Deciduous and Evergreen Trees and Shrubs

Do not apply to home orchards/fruit trees after fruit set.

Cavalier F is a broad spectrum systemic fungicide which controls a variety of foliar, stem, and root diseases on a wide range of commercially important plants. Cavalier F is also effective as a pre-plant dip on cuttings and bulbs. For soil drench applications, best crop protection is achieved with preventative treatments repeated every 21-28 days. For foliar applications, begin treatments when disease first appears, or during suspected periods of disease incidence. Apply additional applications every 7-14 days or as otherwise instructed for the prevention or control of the listed diseases. Use of a wetting agent is recommended for plants that have leaves that are difficult to wet properly. Use of a spreader-sticker is recommended to enhance product performance in wet weather conditions or during periods of overhead irrigation. Cavalier F may be applied as a ground application using hand held, mechanical or motorized spray equipment, or as a chemigation spray or through an applicable sprinkler irrigation system; or as an overhead application where applicable. See specific instructions below. For foliar applications, do not exceed thirty-six (36) pounds active ingredient per acre per crop season from all thiophanate-methyl containing products. For soil drench applications, do not exceed 300 pounds active ingredient per acre per crop season from all thiophanate-methyl containing products.

Note: The "Directions For Use" of this product reflect the cumulative inputs from both historical field use and product testing programs. However, it is impossible to test this product on all species and cultivars. A preliminary trial is suggested on a small scale before a full treatment is applied to any plant type not shown on this label but found in a similar use site with a listed disease problem. Wait 5-7 days after treatment to evaluate results. This product is not recommended for use on Swedish Ivy (*Nephtrolepis exhalta*), Boston Fern (*Plectranthus australis*), and Easter Cactus (*Hatiora gaertneri*).

Application Instructions: Apply material with properly calibrated hand held, mechanical or motorized spray equipment or by chemigation through appropriate sprinkler irrigation, flood, or drip systems. Begin applications when disease first appears and repeat at 7-14 day intervals or as needed during the growing season. Use the shortest interval when conditions are unusually favorable for the development of disease. For hand held, mechanical, or motorized applications, mix 8-24 fl oz of Cavalier F per 100 gal water (0.5-1.5 teaspoons per gal) and apply as a full coverage spray to drip for the prevention and control of the diseases listed below.

Spray volume may range up to 400 gallons of finished spray per acre depending upon plant species and plant growth stage. For applications through irrigation systems, refer to use rates indicated in the foliar application chart. For small volume applications less than 100 gallons, divide recommended rate by 16 to get the number of teaspoons of Cavalier F per gal.

SPECIAL INSTRUCTIONS FOR PROPORTIONAL INJECTORS

(e.g. Dosatron, Dosmatic, Anderson, and similar equipment)

Determine the treatment rate for crop and pathogen from the foliar application table below. Determine the injection ratio for the individual system to be used for application. For systems using a 1:100 ratio, measure and add the exact amount of recommended material per 100 gallons to each gallon of water in a stock bucket or tank. For systems using a 1:200 ratio, multiply the recommended amount per 100 gallons by 2. For systems using a 1:50 ratio, divide the recommended amount per 100 gallons added by 2. For systems using a 1:16 ratio, divide the recommended amount per 100 gallons by 6. Greater accuracy in calibration and distribution will be achieved by injecting a larger volume of a more dilute suspension per unit time. An injection ratio of 1:100 is recommended for most greenhouse and nursery systems.

FOLIAR APPLICATION

Disease(s) Controlled	Rate of Cavalier F	Remarks
Anthraco nose <i>Colletotrichum</i>	12-16 fl oz/100 gallon	Apply as buds break or at first sign of disease. Repeat at 7-14 day intervals as needed during disease period.
Black Spot of Rose <i>Diplocarpon rosae</i>	12-16 fl oz/100 gallon	Apply early summer or at first sign of disease. Repeat every 7-14 days as needed during disease period.
Brown Rot and Blight <i>Monilinia, Sclerotinia, Whetzellinia</i>	12-16 fl oz/100 gallon	Apply late spring or at first sign of disease. Repeat every 7-14 days as needed during disease period.
Fusicladium and Venturia Leaf Scabs on: Crabapple, Hawthorn, Pear, Mountain Ash, Pyracantha, etc.	12-16 fl oz/100 gallon	Apply as buds break. Repeat every 7-14 days during disease period. Effective control requires coverage during leaf expansion. Rotations and/or tank mix combinations with mancozeb (Protect™), chlorothalonil or propiconazole can be utilized. Do not use fruit from treated crabapple or pear trees for food purposes.
Leaf Spots and Blights caused by: <i>Ascochyta, Blumeriella, Botrytis, Cercospora, Coccomyces, Corynespora, Curvularia, Didymellina, Entomosporium, Fabraea, Fusarium, Ramularia, Rhizoctonia, Marssonina, Mycosphaerella, Myrothecium, Phoma, Physalospora, Schizothyrium, Septoria, Sphaeloma</i>	12-16 fl oz/100 gallon	Apply when disease symptoms first appear. Repeat every 7-14 days during disease period. Rotations and/or tank mix combinations with mancozeb (Protect™) or chlorothalonil can be utilized.

Disease(s) Controlled	Rate of Cavalier F	Remarks
Ovulinia Blight	8-16 fl oz/100 gallon	Apply as flowers open. Repeat every 7-14 days during disease period
Powdery Mildews <i>Erysiphe, Microsphaera, Phyllactinia, Podosphaera, Oidium, Sphaerotheca</i>	12-24 fl oz/100 gallon	Apply when disease first appears and repeat every 7-14 days during disease period. Rotations and/or tank mix combinations with mancozeb (Protect™) or triadimefon can be utilized.
Rust Diseases caused by: <i>Puccinia, Gymnosporangium, Uromyces</i>	12-16 fl oz/100 gallon	Apply late spring or when symptoms first appear. Repeat every 7-14 days during disease period. Rotations and/or tank mix combinations with mancozeb (Protect™) or chlorothalonil are recommended.
Tip Blight of Pine <i>Sphaeropsis sapinea, Diplodia pinea</i>	16-24 fl oz/100 gallon	Begin application in spring when new growth starts. Make a second application just before needles emerge from the sheath and a third application 14 days later. Thorough coverage is essential for optimal disease control.
Twig Blights, Cankers, and Diebacks <i>Diaporthe, Kabatina, Phoma, Phomopsis</i>	16-24 fl oz/100 gallon	Apply when symptoms first appear. Repeat every 7-14 days during disease period.

SOIL DRENCH APPLICATION

Disease(s) Controlled	Rate of Cavalier F	Remarks
Stem, Crown, and Root Rots caused by: <i>Botrytis, Cylindrocladium, Fusarium, Gliocladium, Myrothecium, Penicillium, Ramularia, Rhizoctonia, Black Root Rot Thielaviopsis</i>	8-16 fl oz/100 gallon	Apply as a drench or directed spray using hand held, mechanical or motorized spray equipment or as a chemigation drench or directed spray using applicable sprinkler irrigation systems after seeding or sticking of cuttings (8 fl oz) or after transplanting (12-16 fl oz) to propagation beds, containers, pots, trays, or nursery or landscape beds at a rate to thoroughly soak the growing media through the root zone. A general guide is 0.25-3.0 pints of finished mixture per sq ft depending on the media type and depth (about 4 fl oz per 4 inch pot or 8 fl oz per 6 inch pot). Repeat every 21-28 days for adequate crop protection. Note: Cavalier F does not control <i>Pythium</i> or <i>Phytophthora</i> . Tank mix combinations with metalaxyl, mephenoxam, etridiazole, propamocarb, fosetyl-Al or mono and dipotassium salts of phosphorous acid are required for the control of <i>Pythium</i> and <i>Phytophthora</i> .

PLANT DIP APPLICATION

Disease(s) Controlled	Rate of Cavalier F	Remarks
Plant or Cutting Diseases caused by: <i>Botrytis</i> , <i>Cylindrocladium</i> , <i>Fusarium</i> , <i>Gliocladium</i> , <i>Myrothecium</i> , <i>Penicillium</i> , <i>Ramularia</i> , <i>Rhizoctonia</i> , <i>Sclerotinia</i> , <i>Thielaviopsis</i>	16-24 fl oz/100 gallon	Immerse plants or cuttings for 10-15 min. Remove and allow to drain. Note: Follow accepted hygiene practices to minimize the introduction and spread of water borne bacterial and water mold fungal diseases.
Bulb, Corm, and Rhizome Rots caused by: <i>Botrytis</i> , <i>Cylindrocladium</i> , <i>Fusarium</i> , <i>Gliocladium</i> , <i>Myrothecium</i> , <i>Penicillium</i> , <i>Ramularia</i> , <i>Rhizoctonia</i> , <i>Sclerotinia</i> , <i>Thielaviopsis</i>	16-24 fl oz/100 gallon	Soak cleaned bulbs for 15-30 min in warm solution (80-85° F). For storage disease prevention, treat bulbs preferably within 48 hours after digging. After treatment, dry well before storing. If bulbs are for forcing, treat bulbs that have been heat-cured. Note: Follow accepted hygiene practices to minimize the introduction and spread of water borne bacterial and water mold fungal diseases.

LIMITED WARRANTY AND DISCLAIMER

CLEARY CHEMICAL CORPORATION warrants that this material 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 risks referred to therein. CLEARY CHEMICAL CORPORATION makes no other expressed or implied warranty of fitness or merchantability or any other expressed or implied warranty. In no case shall CLEARY CHEMICAL or seller be liable for consequential, special or indirect damages resulting from the use or handling of this product including, but not limited to, loss of profits, business reputation, or customers, labor costs, or other expenses incurred in planting or harvesting. CLEARY CHEMICAL 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 CLEARY CHEMICAL CORPORATION.



DISTRIBUTED BY:
CLEARY CHEMICAL CORPORATION
178 RIDGE ROAD, SUITE A
DAYTON, NJ 08810-1501
800-524-1662
www.clearychemical.com

Effective: 10/02/05
Accepted Date: 05/17/04
Replaces: 08/99

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CLEARY MATERIAL SAFETY DATA SHEET

Cavalier™ F

Page 1 of 4

Please read the entire document. This Material Safety Data Sheet contains important environmental, health and toxicology information for your employees, and anyone who will use, transport, store, dispose of or handle this product. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information contained herein must be incorporated in your MSDS.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Cavalier F
EPA REGISTRATION NUMBER(S): 1001-69
CHEMICAL NAME: Dimethyl-4-4'-o-phenylenebis-3-thioallophanate
SYNONYM: Thiophanate methyl
GENERAL USE: Turf and ornamental fungicide

COMPANY

Cleary Chemical
178 Ridge Road, Suite A
Dayton, New Jersey 08810

EMERGENCY TELEPHONE NUMBERS

CLEARY CHEMICAL CORP. | PROSAR:
M-F 9-5 EST | (800) 324-7598
(800) 524-1662 OR | CHEMTREC 24 HOUR:
(732) 329-8399 | (800) 424-9300

SECTION 2: INFORMATION ON INGREDIENTS

Active Ingredient(s)/ Hazardous Ingredient(s)	% by Wt.	CAS#	ACGIH TLV	OSHA PEL
Dimethyl-4-4'-o-phenylenebis-3-thioallophanate	41.25	23564-05-8	NDA	NDA

SECTION 3: HEALTH HAZARD INFORMATION

Inhalation: N/A
Eye Contact: May cause transient irritation.
Ingestion: May cause irritation.
Skin Contact: Non-irritating, not a known sensitizer.
Chronic Effects of Overexposure: Irritation of eyes, nose and throat, dermatitis, headache and nausea.

SECTION 4: FIRST AID MEASURES

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
IF SWALLOWED: Call 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 the poison control center or doctor. Do not give anything by mouth to an unconscious person. Have the product container or label with you when calling a poison control center or doctor, or when going for treatment.
For 24-Hour Emergency Assistance Call Chemtrec 1-800-424-9300.

Effective Date: 10/12/05
NDA = No Data Available NA = Not Applicable

SECTION 5: FIRE AND EXPLOSION INFORMATION

Flash Point (Method): NA
Flammable Limits (vol % in air): NA
Autoignition Temperature: NA
Extinguishing Media: Carbon dioxide, foam, water, earth, dry chemical.
Special Fire Fighting Procedures: Self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: None

SECTION 6: ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled: Absorb with sand or inert material, sweep or scoop up and remove, flush area with water. Dispose of in compliance with all federal, state and local laws.

SECTION 7: HANDLING AND STORAGE

Precautions to be Taken in Handling and Storing: Store in original sealed containers in a cool dry area not accessible to children or unauthorized persons.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Clothing: Long sleeve shirt, pants, or coveralls, water resistant boots.
Eye Protection: Chemical goggles or safety glasses with side shields recommended when handling concentrate.
Ventilation: Use product outdoors or in a well ventilated area.
RESPIRATORY PROTECTION (exposures in enclosed areas): a respirator with either an organic vapor-removing cartridge with NIOSH approved organic vapor (OV) cartridge or canister with any N, R, P or HE filters.
Other: Protective barrier cream may be applied on exposed skin areas.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Off-white liquid suspension, faint sulfur odor.
Boiling Point:	212° F
Vapor Pressure (@25° C):	7.12 x 10-8 mm Hg
pH:	6.8 - 7.2
Melting Point:	NA
Freezing Point:	23° F
Specific Gravity (25° C):	1.198 @ 20/21° C
Vapor Density:	NA
Evaporation Rate:	NA
Solubility in Water:	Insoluble (dispersible)
% VOC	Zero

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Stability: Stable
Incompatible Materials: Highly alkaline materials, oxidizing agents, lime sulfur, bordeaux mixture, copper compounds.
Conditions to Avoid: Extreme heat
Hazardous Decomposition: Thermal decomposition generates oxides of nitrogen, sulfur, and carbon.
Hazardous Polymerization: NA

Effective Date: 10/12/05
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SECTION 11: TOXICOLOGICAL INFORMATION

Oral (acute) LD50: > 6000 mg/kg (rat)
Dermal (acute) LD50: > 2,000 mg/kg (rabbit)
Inhalation (acute): > 20.8 mg/L (LC50 rat 4 hour)
Chronic (oral): No oncogenicity, no observed effect level, 160 ppm in diet for two years (rat) and 50 mg/kg/day in single dose for two years (dog).
Subchronic (oral): No observable effect level, 1,600 ppm in diet for 180 days (rats and mice).
Neurotoxicity: No delayed neurotoxicity or cholinesterase inhibition.
Oncogenicity: No oncogenicity to mice consuming diets containing levels as high as 640 ppm over a two year period.
Teratogenicity: No teratology to rats or mice dosed throughout pregnancy with levels as high as 1,000 mg/kg/day.
Reproductive Toxicity: No effect on spermatogenesis, testosterone assimilation. Three generation study showed no evidence of effects on fertility, fecundity or offspring.
Mutagenicity: Ames, Mammalian Somatic, Cytogenicity, Dominant Lethal, DNA Damage/Repair, all test negative.

SECTION 12: ECOLOGICAL INFORMATION

This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water by disposal of equipment washwaters. Do not apply, allow to drift, or drain or flush equipment onto non-target areas.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Improper disposal of excess pesticide, spray mixture or rinsate is a violation of federal law. If these wastes cannot be disposed of by intended use according to label instructions, contact the appropriate agency in your state or the nearest EPA Regional Office for guidance.

SECTION 14: TRANSPORTATION INFORMATION

DOT Shipping Description: Fungicide, Agricultural, Solid, N.O.I.
DOT Hazard Classification: Not DOT regulated
DOT Label Requirements: N/A
OSHA Hazard Classification: N/A
Reportable Quantity: N/A
Hazardous Substance: N/A
UN Identification Number: N/A

SECTION 15: REGULATORY INFORMATION

EPA SARA TITLE III DATA: N/A
SECTION 302 Substances: N/A
RCRA Waste Number: N/A
Section 311/312 Hazardous Categories: N/A
Immediate Health: No
Delayed Health: No
Fire: No
Reactive: No
Sudden Pressure: No
SECTION 313 TOXIC CHEMICALS: NA
CERCLA RQ: N/A
CALIFORNIA PROP 65: Development Toxin
 This product does contain the following chemical(s), as indicated below, currently on the California List of Developmental Toxins.
 Thiophanate methyl)
NFPA RATINGS
Flammability: 0
Reactivity: 0
Health: 1

Effective Date: 10/12/05
 NDA = No Data Available NA = Not Applicable

SECTION 16: OTHER INFORMATION

Please note: Cleary Chemical Corp. believes that the information and recommendations contained herein are accurate as of the date hereof. The information provided herein applies only to the specific product designated and may not be valid where said product is used in combination with any other material or in any process. It is the users responsibility to determine the suitability of the information for their purposes.

No warranty of fitness for any particular purpose, warranty of merchantability, or any other warranty, expressed or implied, is made concerning the information provided.

Reason for Issue:	Update
Prepared by:	Rick Fletcher
Effective date:	06/02/05
Replaces:	3/00

Effective Date: 10/12/05
NDA = No Data Available NA = Not Applicable



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CLEARY CHEMICAL CORPORATION
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EMERGENCY PHONE NUMBERS:

M-F 9AM-5PM EDT
800-524-1662
732-329-8399

24-Hour CHEMTREC
800-424-9300

Effective Date: 10/02/05

Base Label

CAVALIER™ F

TURF AND ORNAMENTAL SYSTEMIC FUNGICIDE

For the prevention and control of turf diseases and the diseases of annual and perennial flowers, bedding plants, foliage plants, ground covers, plus deciduous and evergreen trees and shrubs.

ACTIVE INGREDIENT:

Thiophanate-methyl (dimethyl 4,4'-o-phenylenebis[3-thioallophanate])41.25%

OTHER INGREDIENTS58.75%

TOTAL100.00%

This product contains 4.0 lb thiophanate-methyl per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID

● IF INHALED:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
● IF ON SKIN OR CLOTHING:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
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EPA Reg. No. 1001-69
EPA Est. No. 70815-GA-1
CLEARY CHEMICAL CORPORATION
178 RIDGE ROAD
DAYTON, NJ 08810-1501



NET CONTENTS: 2.5 Gallons

Effective Date: 10/02/05

Accepted Date: 05/17/04

Replaces: 08/99

EMERGENCY PHONE NUMBERS:

M-F 9AM-5PM ET

800-524-1662 • 732-329-8399

24 Hour CHEMTREC

800-424-9300