



U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Registration Division (7505C)
401 "M" St., S.W.
Washington, D.C. 20460

EPA Reg. Number:
7969-196

Date of Issuance:
JUL 21 2003

Term of Issuance: Unconditional

Name of Pesticide Product:
Emerald Fungicide

NOTICE OF PESTICIDE:

Registration
 Reregistration

(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

BASF Corporation
P.O. Box 13528
Research Triangle Park, NC 27709
Attention: Khalid Akkari, Ph.D.

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

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

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

This product is unconditionally registered in accordance with FIFRA sec. 3(c)(5) provided that you comply with the following terms and conditions of the registration:

1. Add the phrase "EPA Registration No. 7969-196 to your label before you release the product for shipment.

2. Submit the following studies conducted in accordance with the Good Laboratory Practice Standards, 40 CFR part 160; the Data Requirements for Registration Regulations, 40 CFR Part 158; and appropriate test guidelines as referenced in 40 CFR Part 158.

SEE THE ATTACHMENT "CONDITIONS OF REGISTRATION"

Signature of Approving Official:

Cynthia Giles-Parker
Product Manager (22)
Fungicide Branch
Registration Division (7505C)

Date:

JUL 21 2003

*EPA Registration No. 7969-196
Emerald Fungicide*

Submit production information (pounds or gallons produced) for this product for the fiscal year in which the uses are conditionally registered, in accordance with FIFRA section 29. The fiscal year begins October 1 and ends September 30. Production information will be submitted to the Agency no later than November 15, following the end of the preceding fiscal year. This information must be submitted to:

U.S. Environmental Protection Agency
Office of Pesticide Programs
Registration Support Branch
Registration Division (7505C)
Washington, D.C. 20460

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

A stamped copy of the label is enclosed for your records. Submit one (1) copy of the revised final printed label before you release the product for shipment.

enclosures

Conditions of Registration
Label accepted w/comments

JUL 21 2006

EPA Registration No. 7969-196
Emerald Fungicide

CONDITIONS OF REGISTRATION

1. Submission of a radiovalidation study to support the adequacy of the proposed tolerance enforcement method (DFG S19) for livestock matrices. These radiovalidation data will also be used in support of the data collection method (471/0) for livestock matrices. Submission due date - December 31, 2003.
2. Submission of radiovalidation data demonstrating the efficiency of the microwave hydrolysis step in Method 476/0, which determines bound residues of BAS 510 F in milk and liver. Submission due date - December 31, 2003.
3. Submission of all the proposed data collection and tolerance methods, revised to state that solutions of analytical standards should not be stored longer than 2 months before replacement. Submission due date is August 30, 2004. The proposed enforcement methods should also be revised in accordance with any comments made by ACB/BEAD arising from the TMV trials. All revisions to the method are due within 4 months once the company has been notified of all changes that are needed.
4. Submission of the Final Report of the storage stability study in plant matrices. The report should include a description of the fortification solutions (solvent) used in the study and a full description of the analytical method (445/0). Submission due date - August 30, 2004
5. Submission of data demonstrating the frozen storage stability of BAS 510 F residues in processed grape juice (2 months) and tomato paste (5 months). Submission due date - December 31, 2003.
6. Submission of the following additional field trials, conducted per their respective proposed use pattern: Submission due date August 31, 2004.
 - ▶ 3 for mustard greens (one each from Regions 2, 3, and 10)
 - ▶ 2 for cucumber (one each from Regions 2 and 10)
 - ▶ 1 for sunflower seed (from Region 5)
7. Submission of a limited field accumulation study (two sites) which provides residue data on beet tops (sugar or garden) and turnip tops, from beets and turnips planted as rotational crops into treated soil 14 days following the last of 3 applications of BAS 510 F totaling ~1.8 lbs ai/A. Provided those data show the rotational crop tolerance of 1.0 ppm for the leaves of root and tuber vegetables (crop group 2) is not exceeded, further studies would not be required. Submission due date - August 31, 2004.

EPA Registration No. 7969-196
Emerald Fungicide

8. Submission of a limited field accumulation study (two sites) which provides residue data on spinach and celery, planted as rotational crops into treated soil 14 days following the last of 3 applications of BAS 510 F totaling ~1.8 lbs ai/A. Provided those data show the 1.0 ppm rotational tolerance on crop group 4 (except lettuce) is not exceeded, further studies would not be required. Alternatively, the petitioner may submit a full set of crop field trials data for spinach (6) and celery (6), via a use pattern similar/identical to that for lettuce, and request a direct use tolerance on all of crop group 4. Submission due date - August 31, 2004.
9. Revised Section F. Submission due date - August 30, 2003
10. Aquatic toxicity tests using fish and invertebrates were classified as supplemental since water quality parameters did not adhere to standards recommended by the Agency. If the registrant can demonstrate that pH, water hardness and the use of dechlorinated tap water do not affect the toxicity of boscalid and if it can be demonstrated that mean measured concentrations accurately reflect the amount of chemical in solution, these studies can be upgraded to core. Submission due date - August 31, 2004.
11. Submission of a freshwater invertebrate life cycle study - none of the required data are provided on growth (length and weight) of *Daphnia magna*. If these data are not available, the study must be repeated. Submission due date - August 31, 2004.
12. Submission of the toxicity data must be provided for freshwater mollusc such as *Corbicula spp.*, given the persistence of boscalid and its tendency to partition on to sediments. Submission due date - August 31, 2004.
13. A 21/28 day inhalation study. Submission due date - August 31, 2004.
14. For the product Emerald the acute oral, acute dermal, acute inhalation and primary skin irritation studies are classified as supplementary. The above studies are potentially upgradable depending on an adequate explanation of the deviations. Submission due date - February 27, 2004
15. For the product Emerald, the dermal sensitization study is classified as unacceptable because the highest minimally irritating concentration of test substance was not established. A new study must be submitted to satisfy the requirements for registration. Submission due date - August 31, 2004.

ACCEPTED
with COMMENTS
In EPA Letter Dated:

JUL 21 2003

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



Emerald[®]

F U N G I C I D E

7969-196

For disease control on golf course turfgrass

Active Ingredient:

Boscalid, 3-pyridinecarboxamide,2-chloro-N-(4'-chloro(1,1'-biphenyl)-2-yl)	70.0%
Inert Ingredients:	30.0%
Total	100.0%

EPA Reg. No. 7969-ROA

EPA Establishment No.

Keep out of reach of children.

WARNING / AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **First Aid, Precautionary Statements, Directions For Use** and **Conditions of Sale and Warranty.**

**BASF
PROFESSIONAL
TURF**



Net contents:

www.turffacts.com

FIRST AID	
If in eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information: 1-800-832-HELP (4357).	

Precautionary Statements

Hazards to Humans and Domestic Animals

Warning. Causes substantial but temporary eye injury. Harmful if absorbed through skin. Harmful if swallowed. Do not get in eyes or on clothing. Avoid contact with skin, eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Protective eyewear (goggles, face shield or safety glasses)
- Long-sleeved shirt and long pants
- Chemical resistant gloves
- Shoes plus socks

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

User Safety Recommendations

Users should:

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

Environmental Hazards

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

Surface Water Advisory

This product may contaminate water through drift of spray in wind. This product has a potential for runoff according to the pesticide's "mean" soil partition coefficient (15 mL/g²) for several months or more after application. Poorly draining soils and soils with shallow watertables are more prone to produce runoff that contains this product. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential for contamination of water from rainfall-runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecast to occur within 48 hours.

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. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

This product is intended for golf course use only. Not for use on residential turfgrass, turfgrass being grown for sale or other commercial use such as sod production, seed production or for research purposes.

Nonagricultural Use Requirements

The requirements in this box 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, nurseries, or greenhouses.

Do not enter or allow others to enter treated areas until sprays have dried.

Storage and Disposal

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

- **Pesticide Storage:** Do not store at extreme temperatures. Store in a dry place away from heat or open flame.
- **Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. If these wastes cannot be disposed of 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 Disposal:** Triple rinse (or equivalent). Puncture and dispose of in a sanitary landfill or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

In Case of Spill

In case of large-scale spillage regarding this product, call:

CHEMTREC 800-424-9300
BASF Corporation 800-832-HELP

Steps to be taken in case material is released or spilled:

Wear the personal protective equipment specified on the label. Recover the material for re-use according to label whenever possible. Sweep and/or shovel up the spilled material into an appropriate closed container. Avoid the creation of dusty conditions. Remove and wash clothing and personal protective equipment prior to re-use. Keep the spill out of all sewers and open bodies of water.

I. General Information

Emerald® fungicide is a systemic anilide fungicide recommended for the control of dollar spot (*Sclerotinia homoeocarpa*) and bentgrass dead spot (*Ophiosphaerella agrostis*) of golf course turfgrass. Optimum disease control is achieved when **Emerald** is applied in a regularly scheduled preventative spray program and is used in a rotation program with other effective fungicides. Because of its high specific activity, Emerald has good residual activity against target fungi.

For the control of turfgrass diseases not listed on

this label, **Emerald** may be tank mixed with labeled rates of other fungicides. Follow label directions of any tank mix product and apply at the recommended rate based on target disease. All applications should be made according to the use directions that follow. Failure to follow directions and precautions on this label may result in turfgrass injury and/or inferior disease control.

II. Application Information

Emerald is a systemic fungicide recommended for the control of dollar spot and bentgrass dead spot of golf course turfgrass. Emerald may be applied as a solo foliar spray or in tank mixes with other registered turfgrass fungicides. Do not exceed the recommended application rate or fail to comply with use restrictions listed in the **Resistance Management** and **General Restrictions and Limitations** sections. All applications should be made according to the use directions that follow. Failure to follow directions and precautions on this label may result in turfgrass injury and/or inferior disease control.

Turfgrass Uses and Tolerance:

Emerald turf fungicide can be used on golf course turfgrass only. Due to variability within turfgrass species, application techniques and possible tank mixes, neither the manufacturer nor the seller has determined whether or not **Emerald** has adequate tolerance on all turfgrasses under all conditions. Therefore, it is recommended that the user apply the recommended use rate of **Emerald** on a small test area under conditions expected to be encountered and monitor for any adverse effects before applying **Emerald** to the targeted area.

Spray Instructions:

For maximum efficacy, **Emerald** should be applied prior to or in the early stages of disease development. For maximum efficacy, apply **Emerald** at the rates indicated in **Table 1** in 2 to 4 gallons of water per 1,000 square feet (87 to 174 gallons per acre). Use the shorter specified application interval and/or the higher specified rate when prolonged favorable disease conditions exist. Applications should be repeated at the specified interval as necessary.

- Emerald is most effective when applied preventatively.
- Actual length of disease control will vary depending on environmental conditions, disease pressure, and turfgrass management practices.
- Calibrate sprayer prior to use.
- After application, allow foliage to dry prior to mowing or irrigation.
- Apply Emerald using sufficient water volume and pressure for adequate coverage of the foliage.
- Apply the recommended rate of Emerald as instructed in the Specific Use Directions with ground spray equipment.

Resistance Management

The active ingredient in **Emerald® fungicide** is boscalid, an anilide (carboxamide) fungicide. Boscalid is effective against strains of dollar spot resistant to other turfgrass fungicides, such as the dicarboximides, sterol inhibitors, or benzimidazoles. Fungal isolates resistant to anilide fungicides, such as boscalid, may eventually dominate the fungal population if boscalid is used predominantly and repeatedly in the same turfgrass area in successive years as the primary method of control for the targeted pathogen species. This may result in reduction of disease control by **Emerald**.

To maintain the performance of **Emerald** in turfgrass, do not exceed the total number of sequential applications of **Emerald**. Adhere to the label instructions regarding the consecutive use of **Emerald**.

The following recommendations may be considered to delay the development of fungicide resistance:

1. **Tank mixtures:** Use tank mixtures with fungicides from different target site of action groups that are registered/permitted for the same use and that are effective against the pathogens of concern. BASF recommends using at least the minimum labeled rates of each fungicide in the tank mix.
2. **IPM: Emerald** should be integrated into an overall disease and pest management program. Cultural practices known to reduce disease development should be followed. **Emerald** may be used in advisory (disease forecasting) programs that recommend application timing based on environmental factors favorable for disease development.
3. **Monitoring:** Monitor efficacy of all fungicides used in the disease management program against the targeted pathogen and record other factors that may influence fungicide performance and/or disease development. If **Emerald** appears to be less effective against a pathogen that it previously controlled or suppressed, contact a BASF representative or local turfgrass expert for further investigation.

Do not make more than two (2) sequential applications of Emerald for dollar spot or bentgrass dead spot. Then alternate to another effective fungicide before reapplying Emerald.

Addition of Additives

Due to the large number of additives or adjuvants that may be used, neither the manufacturer nor the seller has determined whether **Emerald** can be used safely with all additives.

General Tank Mixing Information

Tank Mix Partners/Components:

Emerald is compatible with most fungicide, insecticide and fertilizer products. If tank mixtures are used, adhere to restrictions due to rates, label recommendations and precautions on all labels. Physical incompatibility, reduced disease control, or turfgrass injury may result from mixing **Emerald** with fungicides, herbicides, insecticides, additives, or fertilizers. To improve control of certain diseases, **Emerald** may be tank mixed with other effective fungicides such as Curalan® EG, Iprodione Pro or Propiconazole Pro.

Compatibility Test for Tank Mix Components:

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

- 1) **Water:** - For 87 gallons per acre (2 gallons per 1,000 square feet) spray volume, use 14.4 cups (3.5 liters) of water. For other spray volumes, adjust rates accordingly. Use only water from the intended source at the source temperature.
- 2) **Water-dispersible products:** -(dry flowables, wettable powders, suspension concentrates, or suspo-emulsions) Cap the jar and invert 10 cycles.
- 3) **Water-soluble products:** - Cap the jar and invert 10 cycles.
- 4) **Emulsifiable concentrates:** - (oil concentrate or methylated seed oil when applicable) Cap the jar and invert 10 cycles.
- 5) **Water-soluble additives:** - Cap the jar and invert 10 cycles.
- 6) Let the solution stand for 15 minutes.
- 7) **Evaluate** the solution for uniformity and stability. The spray solution should not have free oil on the surface, nor fine particles that precipitate to the bottom, nor thick (clabbered) texture. Do not use any spray solution that could clog spray nozzles.

Mixing Order:

Limit amount of spray mixture prepared to that needed for immediate use.

- 1) **Water:** Begin by agitating a thoroughly clean sprayer tank half full of clean water.
- 2) **Products in PVA bags:** Place the water-soluble PVA bag into the mixing tank. The water-soluble PVA bag will dissolve in water to allow the contents to disperse. Wait until all water-soluble PVA bags have fully dissolved and the product is evenly mixed in the spray tank before continuing.
- 3) **Water-dispersible products:** (dry flowables such as **Emerald**, wettable powders, suspension concentrates, or suspo-emulsions)
- 4) **Water-soluble products**

- 5) **Emulsifiable concentrates:** (oil concentrate or methylated seed oil when applicable)
- 6) **Water-soluble additives:** (AMS or UAN when applicable)
- 7) Remaining quantity of water

Cleaning Spray Equipment:

Spraying equipment must be cleaned thoroughly before and after applying this product, particularly if a product with the potential to injure turfgrass was used prior to **Emerald® fungicide**.

Maintain maximum constant agitation during application. **Do not allow mixture to stand for extended periods prior to application.**

General Restrictions and Limitations

- Maximum seasonal use rate: Do not apply more than a total of 1.1 ounces of Emerald® fungicide per 1,000 sq. ft. per year (48 ounces Emerald per acre per year).
- Refer to section Specific Use Directions for sequential application intervals for Emerald.
- Do not apply this product to crops other than golf course turfgrass.
- Do not apply through any type of irrigation equipment.
- This product cannot be used to formulate or reformulate any other pesticide product.

Specific Use Directions

Golf Course Turfgrass

Emerald is recommended for the control of dollar spot and bentgrass dead spot in golf course turfgrass. For maximum efficacy, **Emerald** should be applied prior to or in the early stages of disease development. Apply **Emerald** at the rates indicated in **Table 1** in 2 to 4 gallons of water per 1,000 square feet (87 to 174 gallons per acre). Use the shorter specified application interval and/or the higher specified rate when prolonged favorable disease conditions exist. Applications should be repeated at the specified interval as necessary.

Table 1. Application Rates and Intervals for Emerald® fungicide on Golf Course Turfgrass.

Disease (Pathogen)	Rate (oz. Emerald® per 1,000 square feet)	Rate (oz. Emerald® per acre)	Application Intervals (days)	Comments
Dollar Spot (<i>Sclerotinia homoeocarpa</i>)	0.13-0.18	5.7-8.0	14-28	Begin applications prior to or in the early stages of disease development. Use the shorter specified application interval and/or the higher specified rate when prolonged favorable disease conditions exist.
Bentgrass Dead Spot (<i>Ophiosphaerella agrostis</i>)	0.18	8.0	14	

Do not apply more than two (2) sequential applications of Emerald. Then alternate to another effective fungicide before reapplying Emerald.

Table 2. Dilution Table for Spray Solutions of Emerald fungicide.

Emerald Use Rate (oz. per 1000 sq. ft.)	Ounces of Emerald per 100 gallons of spray solution		
	Spray Volume - 2 gallons per 1000 sq. ft.	Spray Volume - 3 gallons per 1000 sq. ft.	Spray Volume - 4 gallons per 1000 sq. ft.
0.13	6.5	4.3	3.3
0.18	9.0	6.0	4.5

10/10

Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. All such risks shall be assumed by the Buyer. BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above. BASF MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. IN NO CASE SHALL BASF OR THE SELLER BE LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT. BASF and the 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 BASF.

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