



STATE OF MAINE  
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY  
BOARD OF PESTICIDES CONTROL  
28 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

PAUL R. LePAGE  
GOVERNOR

WALTER E. WHITCOMB  
COMMISSIONER

To: Board of Pesticides Control Members  
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist  
RE: EPA Special Local Need (SLN) [FIFRA, Section 24(c)] request to extend the use of Echo Zn, EPA Reg. No. 60063-4, for control of late blight (*Phytophthora infestans*) in long-season potatoes  
Date: August 10, 2016

\*\*\*\*\*  
Enclosed is the above referenced Special Local Need (SLN) [FIFRA, Section 24(c)] application and supporting documents for your consideration.

On May 16, 2016, the Board of Pesticides Control approved a Section 24(c) registration for use of Bravo Zn to control late blight (*Phytophthora infestans*) in long-season potatoes. This request is to approve a 24(c) registration for Echo Zn Agricultural Fungicide, EPA Reg. No. 60063-4, another brand containing 38.5% chlorothalonil. Consistent with the SLN for Bravo Zn, the SLN increases the total allowable use of Echo Zn from 21 pints per acre to 30½ pints per acre per year.

Please review the following documents and let me know if you have any questions.

- § FIFRA, Section 24(c) application
- § Letter of request from SipCam Agro USA Inc.
- § Letters of request from Steve Johnson, Crops Specialist, Maine Cooperative Extension
- § Echo Zn ME-16000X draft Maine SLN label
- § Echo Zn Section 3 container label
- § Echo Zn Section 3 EPA approved label
- § Echo Zn SDS

Please review these materials and let me know if you have any questions.

HENRY JENNINGS, DIRECTOR  
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-2731  
WWW.THINKFIRSTSPRAYLAST.ORG

United States Environmental Protection Agency  
Office of Pesticide Programs, Registration Division (7505C)  
Washington, DC 20460



**Application for/Notification of State Registration  
of a Pesticide To Meet a Special Local Need**  
*(Pursuant to section 24(c) of the Federal Insecticide,  
Fungicide, and Rodenticide Act, as Amended)*

**For State Use Only**  
Registration No. Assigned  
ME-16000X  
Date Registration Issued

1. Name and Address of Applicant for Registration	2. Product is (Check one)	
	<input type="checkbox"/> EPA-Registered	EPA Registration Number
	<input type="checkbox"/> New (not EPA-registered) Attach EPA Form 8570-4, Confidential Statement of Formula for new products.	EPA Company Number
3. Active Ingredient(s) in Product		

4. Product Name	5. If this is a food/feed use, a tolerance or other residue clearance is required. Cite appropriate regulations in 40 CFR Part 180, 185, and/or 186.
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6. Type of Registration (Give details in Item 13 or on a separate page, properly identified and attached to this form): a. To permit use of a new product. b. To amend EPA registrations for one or more of the following purposes: (1) To permit use on additional crops or animals. (2) To permit use at additional sites. (3) To permit use against additional pests. (4) To permit use of additional application techniques or equipment. (5) To permit use at different application rates. (6) Other (specify below)	7. Nature of Special Local Need (check one) <input type="checkbox"/> There is no pesticide product registered by EPA for such use. <input type="checkbox"/> There is no EPA-registered pesticide product which, under the conditions of use within the State, would be as safe and/or as efficacious for such use within the terms and conditions of EPA registration. <input type="checkbox"/> An appropriate EPA-registered pesticide product is not available.
	8. If this registration is an amendment to an EPA-registered product, is it for a "new use" as defined in 40 CFR 152.3 ? <input type="checkbox"/> Yes (discuss in Item 13 below) <input type="checkbox"/> No
	9. Has an EPA Registration or Experimental Use Permit for this chemical ever been (check applicable box(es), if known): <input type="checkbox"/> Sought <input type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Cancelled <input type="checkbox"/> Suspended <input type="checkbox"/> Registration <input type="checkbox"/> Experimental Use Permit <input type="checkbox"/> No Previous Permit Action

10. Has FIFRA section 24(c) registration for this use of the product ever, by another State, been (check appropriate box(es), if known): <input type="checkbox"/> Sought <input type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Revoked If any of the above are checked, list States in item 13 below. <input type="checkbox"/> No FIFRA section 24(c) Action	11. Endangered Species Act: (Give details in item 13 or on a separate page, properly identified and attached to this form) Identify the counties where this pesticide will be used. If Statewide, indicate "all." Provide a list of Federally protected endangered/threatened species which occur in the areas of proposed use.
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<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.	12. Indicate use status of Special Local Need, i.e., planned dates of use: From: _____ To: _____
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Signature of Applicant or Authorized Representative <i>[Signature]</i>	13. Comments (attach additional sheet, if needed)
Title	
Telephone Number _____ Date August 8, 2016	

**Determination by State Agency**  
This registration is for a Special Local Need and is being issued in accordance with section 24(c) of FIFRA, as amended. To the best of our knowledge, the information above is correct, except as noted in "Comments" below or in attachments.

Name, Title, and Address of State Agency Official Mary E. Tomlinson Maine Board of Pesticides Control 28 State House Station Augusta, ME 04333	Comments (by State Agency Only)	Received by EPA
Title Pesticides Registrar / Water Quality Specialist		
Telephone Number (207) 287-7544 Date		



August 8, 2016

Ms. Mary Tomlinson, Pesticide Registrar/Water Quality Specialist  
Department of Agriculture, Conservation and Forestry  
22 State House Station  
Augusta, ME 04333-0022

Subject: **Echo Zn Agricultural Fungicide Special Local Need to control diseases on full-season potatoes.**

Dear Ms. Tomlinson:

Sipcam Agro USA, Inc. is applying for Special Local Needs Registrations for the use of chlorothalonil (Echo Zn, EPA Reg. No. 60063-4) to aid in the control of late blight on full-season potatoes grown under irrigation by raising the maximum annual a.i. limit from 11.25 lb. ai/a to 16 lb. ai/a.

The following documents are also attached in support of this application.

Attachment 1: Completed EPA Form 8570-25.

Attachment 2: Proposed Echo ZN SLN Label.

Attachment 3: Letter of support – provided by Dr. Steven B. Johnson from the University of Maine Cooperative Extension.

Attachment 4: Echo ZN Agricultural Fungicide (60063-4) current printed/commercial label.

Attachment 5: Echo ZN (60063-4) EPA approval dated February 19, 2013.

Attachment 6: Echo ZN Agricultural Fungicide (60063-4) SDS dated May 26, 2015.

If you need additional information regarding this request, do not hesitate to contact me at [lrea@sipcamadvan.com](mailto:lrea@sipcamadvan.com) or 919-226-1288.

Sincerely,

Lizbeth Rea  
Director of Regulatory Affairs



*Potato Program*

59 Houlton Road, Presque Isle, ME 04769, (207) 554-4373; Fax (207) 554-4373

July 12, 2016

Mary E. Tomlinson  
([Mary.E.Tomlinson@maine.gov](mailto:Mary.E.Tomlinson@maine.gov))  
Pesticide Registrar  
Maine Board of Pesticides Control / 28 SHS /  
Augusta, ME 04333

Dear Mary:

I am supporting a 24c SLN label request to the State of Maine for Echo® Zn (EPA Reg. Number 60063-4) to increase the total allowable active ingredient per acre from 12.0 lb. per year to 16.0 pounds per year. (<https://extension.umaine.edu/potatoes/wp-content/uploads/sites/97/2015/05/Fungicides-15.pdf>) (This would mean raising the allowable use of Echo® Zn from 21 pints per acre to 30½ pints per acre). I would like to see this limited to “Control of Late Blight (*Phytophthora infestans*) for Long-Season Potatoes.” A special local needs (24c) label for increased total allowable chlorothalonil rates exists in Maine (BravoZn) as well as in other states (MI, MN, ND, NE, WI).

The need for increased allowable chlorothalonil rates is real. The high levels of late blight present in previous growing seasons in Maine have been very trying. Many growers with long-season varieties ran out of chlorothalonil limits and EDBC materials were not available. I expect Maine growers to only use the increased limits under severe late blight epidemics.

This SLN label would allow the applicators the flexibility to deal with our unique environment. Please feel free to contact me if have questions or require further information.

Sincerely,

A handwritten signature in black ink that reads 'Steven B. Johnson'.

Steven B. Johnson, Ph.D.  
Crops Specialist

<https://extension.umaine.edu/potatoes/>

The University of Maine and the U.S. Department of Agriculture cooperating.  
Cooperative Extension provides equal opportunities in programs and employment.  
*A Member of the University of Maine System*

**FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF MAINE**  
**For Control of Late Blight on Full-Season Potatoes Grown under Irrigation**  
**ECHO<sup>®</sup> ZN Agricultural Fungicide**  
**Keep Out of Reach of Children**  
**WARNING – AVISO**

EPA Reg. No. 60063-4

EPA SLN No. ME-XXXXXX

This label expires and must not be distributed or used in accordance with this SLN registration after December 31, 2021.

**DIRECTIONS FOR USE**

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

This labeling must be in the possession of the user at the time of pesticide application. Follow all applicable directions, restrictions, Worker Protection Standard requirements, and precautions on the EPA registered label for ECHO ZN.

Applicators must operate under an Irrigation Management Plan for use of this label. Observe application setbacks from surface water and intermittent streams of 25 feet (land application) and 100 feet (aerial application). All necessary precautions must be taken to not contaminate surface or groundwater when disposing of waste pesticide product and rinsate.

TARGET DISEASES	PHI (DAYS)	APPLICATION RATE PINTS PER ACRE (LBS. A.I.)	APPLICATION DIRECTIONS
Late Blight ( <i>Phytophthora infestans</i> )	7	1 pint (0.6) Then 1 1/2 to 2 1/8 pints (0.75 to 1.125)	<p>Begin applications at the low rate when vines are first exposed and leaf wetness occurs. Repeat applications at 5 to 10 day intervals. Begin applying the higher label rates when any one of the following events occurs:</p> <ul style="list-style-type: none"> <li>• Vines close between rows;</li> <li>• Late blight forecasting measures 18 disease severity values (DSV); or</li> </ul> <p>The crop reaches 300 P-days.</p> <p>Increase water spray volume as canopy density increases. Use the highest rate and shortest interval when plants are rapidly growing and disease conditions are severe. A maximum of 30½ pints of ECHO ZN (16 pounds a.i.) per acre may be used on long-season varieties of potato under irrigation during each growing season.</p>

**Integrated Pest Management**

ECHO brand chlorothalonil fungicide is an excellent disease control agent when used according to label directions for control of a broad spectrum of plant diseases. ECHO is recommended for use in programs that are compatible with the principles of Integrated Pest Management (IPM), including the use of disease

FIFRA 24(c) Registrant:

Sipcam Agro USA, Inc.  
2525 Meridian Parkway, Suite 350  
Durham, NC 27713

8/9/2016

Page 1 of 2

resistant crop varieties, cultural practices, pest scouting and disease forecasting systems which reduce unnecessary applications of pesticides.

### **Fungicide Resistance Management**

ECHO brand chlorothalonil fungicide is effective for strategic use in programs that attempt to minimize disease resistance to fungicides. Some other fungicides which are at risk from disease resistance exhibit a single-site mode of fungicidal action. ECHO, with a multi-site mode of action, may be used to delay or prevent the development of resistance to single-site fungicides. Consult with your federal or state Cooperative Extension Service representatives for guidance on the proper use of ECHO in programs which seek to minimize the occurrence of disease resistance to other fungicides.

### **Endangered Species**

It is a violation of federal law to harm an endangered species. Use of this product may be in counties which have endangered and threatened species present; therefore, applicators should evaluate the areas to be treated and take necessary precautions to avoid harming endangered species or their habitat/environment.

### **WARRANTY AND LIMITATION OF DAMAGES**

CONDITIONS OF SALE: To the extent consistent with applicable law, Sipcam Agro USA, Inc. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in accordance with the directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal use conditions, or under conditions not reasonably foreseeable to Sipcam Agro USA, Inc. SIPCAM AGRO USA, INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. To the extent consistent with applicable law, SIPCAM AGRO USA, INC. SHALL NOT BE LIABLE FOR CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, AND SIPCAM AGRO USA, INC.'S SOLE LIABILITY AND BUYER'S AND USER'S EXCLUSIVE REMEDY SHALL BE LIMITED TO THE REFUND OF THE PURCHASE PRICE. BUYER AND USER ACKNOWLEDGE AND ASSUME ALL RISKS AND LIABILITY RESULTING FROM HANDLING, STORAGE AND USE OF THIS PRODUCT. SIPCAM AGRO USA, INC. DOES NOT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE ANY OTHER WARRANTY, GUARANTEE OR REPRESENTATION CONCERNING THIS PRODUCT.

ECHO is a registered trademark of Sipcam Agro USA, Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

Joseph W. Burley  
Sipcam Agro USA, Inc.  
2520 Meridian Pkwy., Suite 525  
Durham, NC 27713

Subject: Echo ZN  
EPA Reg. No. 60063-4  
Amendment dated 1/7/2013 to Clarify Conifer Use Sites  
EPA Decision No. 475099

FEB 19 2013

Dear Mr. Burley,

The amendment referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act as amended, to add clarification language to conifer use sites is acceptable. A copy of the approved label, stamped "Accepted" is enclosed.

If you have any questions, please contact Kaitlin Keller by phone at (703)-308-8172 or via email at [keller.kaitlin@epa.gov](mailto:keller.kaitlin@epa.gov).

Sincerely,

A handwritten signature in black ink that reads "Tony Kish".

Tony Kish  
Product Manager 22  
Fungicide Branch  
Registration Division (7504P)

Enclosure: Label stamped "Accepted"



# SIPCAM AGRO USA, INC.

## ECHO® Zn

Active Ingredient: Chlorothalonil (tetrachloroisophthalonitrile).....	38.5%
Other Ingredients: .....	61.5%
<b>Total:</b> .....	<b>100.0%</b>

Contains 4.17 Pounds Chlorothalonil Per Gallon (500 grams per liter)

### 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.)

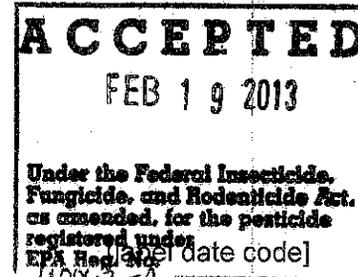
FIRST AID	
IF INHALED	<ul style="list-style-type: none"> <li>➤ Move person to fresh air.</li> <li>➤ If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth to mouth if possible.</li> <li>➤ Call a poison control center or doctor for further treatment advice.</li> </ul>
IF ON SKIN OR CLOTHING	<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>
IF IN EYES	<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>
IF SWALLOWED:	<ul style="list-style-type: none"> <li>➤ Call a poison control center or doctor immediately for treatment advice.</li> <li>➤ Have affected person sip a glass of water if able to swallow.</li> <li>➤ Do not induce vomiting unless told by a poison control center or doctor.</li> <li>➤ Do not give anything by mouth to an unconscious person.</li> </ul>
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
Emergency phone numbers	(800) 858-7378 NPIC (human and animal health) (800) 424-9300 CHEMTREC (transportation and spills)
NOTES TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Persons having a temporary allergic reaction respond to treatment with antihistamines or steroid creams and/or systemic steroids.	

EPA Reg. No. 60063-4

EPA Est. No. \_\_\_\_\_

Net Contents: \_\_\_\_\_ gallons

Manufactured for  
Sipcam Agro USA, Inc.  
2520 Meridian Parkway, Suite 525  
Durham, NC 27713



ECHO is a registered trademark of Sipcam Agro USA, Inc.

**PRECAUTIONARY STATEMENTS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**WARNING - AVISO**

May be fatal if inhaled. Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Do not breathe spray mist. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

**Personal Protective Equipment (PPE):**

Mixers, loaders, applicators and all other handlers must wear:

- Long-sleeved shirt and long pants;
- Shoes plus socks;
- Protective eye wear;
- Chemical resistant gloves made of waterproof material (some of the materials that are chemical-resistant to this product are barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyethylene, polyvinyl chloride, or viton; If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart);
- A NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any N, R, P, or HE prefilter.

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. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. DO NOT reuse them.

**Engineering Controls:**

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

**USER SAFETY RECOMMENDATIONS**

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove contaminated clothing and wash clothing before reuse.

**ENVIRONMENTAL HAZARDS**

This product is toxic to aquatic invertebrates and wildlife. DO NOT apply directly to water or to areas where surface water is present or to intertidal areas below the mean high-water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. DO NOT contaminate water when disposing of equipment washwater or rinsate.

Chlorothalonil can contaminate surface water through spray drift. DO NOT apply when weather conditions favor drift from treated areas. Under some conditions, it may also have a high potential for runoff into surface water for several days to weeks after application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlaying extremely shallow ground water, areas with in-field canals or ditches that drain to surface

water, areas not separated from adjacent surface waters with vegetated filter strips, and areas overlying tile drainage systems that drain to surface water.

Chlorothalonil degradates are known to leach through soil into ground water under certain conditions as a result of label use. Use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

## DIRECTIONS FOR USE

### General Precautions and Restrictions

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, or pets, either directly or through drift. Only protected handlers may be in the area during applications. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard (WPS), 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 (REI). 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 REI of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, chemical resistant gloves made of waterproof material, shoes plus socks, and protective eyewear.

**Special Eye Irritation Provisions:** This product is a severe eye irritant. Although the restricted-entry interval expires after 12 hours, for the next 6½ days entry is permitted only when the following safety measures are provided:

At least one container designed specifically for flushing eyes must be available in operating condition at the WPS-required decontamination site intended for workers entering the treated area.

Workers must be informed, in a manner they can understand:

- that residues in the treated area may be highly irritating to their eyes;
- that they should take precautions, such as refraining from rubbing their eyes, to keep the residues out of their eyes;
- that if they do get residues in their eyes, they should immediately flush their eyes using the eyeflush container that is located at the decontamination site or using other readily available clean water; and
- how to operate the eyeflush container.

This product must not be applied within 150 feet (for aerial and air-blast applications), or 25 feet (for ground applications) from marine/estuarine water bodies unless there is an untreated buffer area of that width between the area to be treated and the water body.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to

Sipcam Agro USA, Inc.

agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most nozzles on the boom must not exceed  $\frac{3}{4}$  the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

### **Aerial Drift Advisory Information**

#### **INFORMATION ON DROPLET SIZE**

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

#### **CONTROLLING DROPLET SIZE**

- **Volume-** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure-** Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles-** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation-** Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle type-** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift potential.

#### **BOOM LENGTH**

For some use patterns, reducing the effective boom length to less than  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.

#### **APPLICATION HEIGHT**

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

#### **SWATH ADJUSTMENT**

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

#### **WIND**

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

#### **TEMPERATURE AND HUMIDITY**

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

#### **TEMPERATURE INVERSIONS**

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a

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

### **Integrated Pest Management**

ECHO is an excellent disease control agent when used according to label directions for control of a broad spectrum of plant diseases. ECHO is recommended for use in programs that are compatible with the principles of Integrated Pest Management (IPM), including the use of disease resistant crop varieties, cultural practices, pest scouting and disease forecasting systems which reduce unnecessary applications of pesticides.

### **Fungicide Resistance Management**

ECHO is effective for strategic use in programs that attempt to minimize disease resistance to fungicides. Some other fungicides which are at risk from disease resistance exhibit a single-site mode of fungicidal action. ECHO, with a multi-site mode of action, may be used to delay or prevent the development of resistance to single-site fungicides. Consult with your federal or state Cooperative Extension Service representatives for guidance on the proper use of ECHO in programs which seek to minimize the occurrence of disease resistance to other fungicides.

### **Mixing, Loading and Applying**

ECHO is intended to be diluted into water, then applied to crops by typical agricultural spraying techniques. **Always apply ECHO in sufficient water to obtain thorough, uniform coverage of foliage and crop surfaces intended to be protected from disease.** Spray volume to be used will vary with crop and amount of plant growth. Spray volume should normally range from 20 to 150 gallons per acre (200 to 1400 liters per hectare) for dilute sprays and 5 to 10 gallons per acre (50 to 100 liters per hectare) for concentrate ground sprays and aircraft applications. Both ground and aircraft methods of application are recommended unless specific directions are given for a crop.

Slowly invert container several times to assure uniform mixture. Measure the required amount of ECHO and pour into the spray tank during filling. Keep agitator running when filling spray tank and during spray operations.

Do not use on greenhouse-grown crops except as directed in the Ornamental Plants section of this label.

### **Tank Mixing**

When tank mixing this product with other pesticides observe the more restrictive label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing.

Do not combine ECHO in sprayer tank with pesticides, surfactants or fertilizers, unless your prior use has shown the combination physically compatible, effective and noninjurious under your conditions of use.

Do not combine ECHO with Dipel 4L, Foil, Triton AG-98, Triton B-1956 or Latron B-1956, as phytotoxicity may result from the combination when applied to the crops on this label. DO NOT tank mix Echo with oil, or with any adjuvants which contain oil as their principal ingredient. When an adjuvant is to be used with this product, Sipcam Advan USA recommends the use of a Chemical Producers and Distributors Association (CPDA) certified adjuvant. Do not use with Copper-Count N in concentrated spray suspensions.

Dipel is a registered trademark of Abbott Laboratories;  
Foil is a registered trademark of Ecogen, Inc.;  
Latron and B-1956 are trademarks of Rohm and Haas Company;  
Copper-Count is a registered trademark of Mineral Research and Development Corporation.

### **Applications Through Sprinkler Irrigation Systems (Chemigation)**

Application through sprinkler irrigation systems is recommended only for those specific crops for which the notation "chemigation OK" is listed on this label.

Apply this product only through center pivot, motorized lateral move, traveling gun, solid set and portable (wheel move, side roll, end tow, or hand move) irrigation system(s). 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, you should contact State Extension Service specialists, equipment manufacturers or other experts.

DO NOT apply this product through irrigation systems connected to a public water system. '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 per year.

Controls for both irrigation water and pesticide injection systems must be functionally interlocked, so as to automatically terminate pesticide injection when the irrigation water pump motor stops. A person knowledgeable of the irrigation system and responsible for its operation shall be present so as to discontinue pesticide injection and make necessary adjustments, should the need arise.

The irrigation water pipeline must be fitted with a functional, automatic, quick-closing check valve to prevent the flow of treated irrigation water back toward the water source. The pipeline must also be fitted with a vacuum relief valve and low pressure drain, located between the irrigation water pump and the check valve, to prevent back-siphoning of treated irrigation water into the water source.

Always inject ECHO into irrigation water after it discharges from the irrigation pump and after it passes through the check valve. Never inject pesticides into the intake line on the suction side of the pump.

Pesticide injection equipment must be fitted with a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump. Interlock this valve to the power system, so as to prevent fluid from being withdrawn from the chemical supply tank when the irrigation system is either automatically or manually turned off.

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 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.

Spray mixture in the chemical supply tank must be agitated at all times, otherwise settling and uneven application may occur. DO NOT apply when wind speed favors drift beyond the area intended for treatment.

ECHO may be used through two basic types of sprinkler irrigation systems as outlined in Sections A and B below. Determine which type of system is in place, then refer to the appropriate directions provided for each type.

#### **A. Center Pivot, Motorized Lateral Move and Traveling Gun Irrigation Equipment**

For injection of pesticides, these continuously moving systems must use a metering pump, such as a positive displacement injection pump of either diaphragm or piston type, constructed of materials that are compatible with pesticides, fitted with a system interlock, and capable of injection at pressures approximately 2 to 3 times those encountered within the irrigation water line. Venturi applicator units cannot be used on these systems.

Fill chemical supply tank of injection equipment with water. Operate system for one complete revolution or run across the field, measuring time required, amount of water injected, and acreage covered. Thoroughly mix recommended amount of ECHO for acreage to be covered into same amount of water used during calibration and inject into system continuously for one revolution or run. Mixture in the chemical supply tank must be continuously agitated during the injection run. Shut off injection equipment after one revolution or run, but continue to operate irrigation system until ECHO has been cleared from last sprinkler head.

#### **B. Solid Set and Portable (Wheel Move, Side Roll, End Tow, or Hand Move) Irrigation Equipment**

With stationary systems, an effectively designed in-line venturi applicator unit is preferred which is constructed of materials that are compatible with pesticides; however, a positive-displacement pump can also be used.

Determine acreage covered by sprinkler. Fill tank of injection equipment with water and adjust flow to use contents over a thirty to forty-five minute period. Mix desired amount of ECHO for acreage to be covered with water so that the total mixture of ECHO plus water in the injection tank is equal to the quantity of water used during calibration and operate entire system at normal pressures recommended by the manufacturer of injection equipment used for amount of time established during calibration. No agitation should be required. ECHO can be injected at the beginning or end of the irrigation cycle or as a separate application. Stop injection equipment after treatment is completed and continue to operate irrigation system until ECHO has been cleared from last sprinkler head.

#### **Application Rates**

Dosage rates on this label indicate pints of ECHO Zn per acre, unless otherwise stated. Under conditions favoring disease development, the high rate specified and shortest application interval should be used.

For each listed crop, the maximum total amount of chlorothalonil active ingredient (lbs a.i./A) which may be applied per acre of that crop (or crop group) during each growing season is given in bold print within a box beneath the crop name. For each crop use situation listed below, the listed maximum individual and seasonal application rates must not be exceeded and the listed minimum retreatment intervals must not be decreased.

## FIELD AND ROW CROPS

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	APPLICATION DIRECTIONS
Asparagus <b>9.0 lbs a.i./A</b>	190 (120 in California)	Rust, Purple spot, Cercospora leaf blight	3 to 5 ¾ pints	Begin applications after harvest of spears, when conditions favor disease development on ferns, generally when leaf wetness occurs. Repeat applications at 2 to 4 week intervals until ferns are no longer productive. Use the high rate and shortest interval when conditions favor disease.
Bean (Snap) <b>9.0 lbs a.i./A</b>	7	Rust  Botrytis blight (gray mold)	2 to 4¼ pints  4¼ pints	Begin applications during early bloom stage or when disease first threatens and repeat at 7 day intervals or as necessary to maintain control.
Beans (Dry) <b>6.0 lbs a.i./A</b> <b>Chemigation OK</b>	14	Rust, Anthracnose, Downy mildew, Cercospora leaf spot (blackeye only), Ascochyta blight	2 to 3 pints	Begin applications during early bloom stage and repeat at 7 to 10 day intervals. For use only on beans to be harvested dry with pods removed.
Cabbage, Chinese Cabbage (tight-headed varieties only), Cauliflower, Broccoli, Chinese Broccoli, Brussels Sprouts <b>12.0 lbs a.i./A</b>	7	Alternaria leaf spot, Downy mildew  Ring spot	2¼ pints  2¾ pints	Begin applications after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development. Repeat at 7 to 10 day intervals or as necessary to maintain control.
Carrot <b>15.0 lbs a.i./A</b> <b>Chemigation OK</b>	0	Cercospora (Early) blight, Alternaria (Late) blight	2¼ to 2¾ pints	Start applications when disease threatens and repeat at 7 to 10 day intervals or as necessary to maintain control.

		Start applications shortly after crop emergence or when transplants are set in the field. For the indicated rates, re-apply at:	
Celery	<b>18.0 lbs a.i./A</b>	7	1½ to 2-1/8 pints
	Chemigation OK		3 to 5 day intervals
Corn (sweet), Corn grown for seed	<b>9.0 lbs a.i./A</b>	14	3 to 4¼ pints
	Cranberry		7 day intervals
<b>15.0 lbs a.i./A</b>	Chemigation OK; solid set systems only	50	1-1/8 to 2¾ pints
			Apply at shoot emergence to early bloom and repeat at 10 to 14 day intervals. Under severe disease conditions use the high rate on a 10 day schedule. DO NOT apply to bogs when flooded or allow release of irrigation water from bogs for at least 3 days following application.
Cucurbits: Cucumber, Cantaloupe, Muskmelon, Honeydew melon, Watermelon, Squash, Pumpkin	<b>15.75 lbs a.i./A</b>	0	2¼ to 2¾ pints
			Chemigation OK

Grasses Grown for Seed <b>4.5 lbs a.i./A</b>	14	Stem rust, Leaf rust, Stripe rust, Septoria leaf spot, Glume blotch, Bipolaris and Drechslera leaf spots	1½ to 2 pints	Begin applications during stem elongation when conditions favor disease development. Re-apply at flag (top) leaf emergence and repeat applications at 14 day intervals. DO NOT allow livestock to graze in treated areas. Do not feed straw, seed or seed screenings to livestock.					
		Selenophoma eyespot	1½ to 3 pints						
Mint <b>3.0 lbs a.i./A</b>	80	Rust, Septoria leaf spot	2 pints	Begin applications when emerging plants are 4 to 8 inches high. Repeat applications at 7 to 10 day intervals or as necessary to maintain control. Based on available residue data, use of this product on mint is restricted to Indiana, Michigan and Wisconsin.					
Mushroom beds	5 Do not apply after first break (harvest)	Verticillium brown spot and dry bubble	Rate per 1,000 sq. ft. of bed surface 4 to 8 fl. oz.	Apply as a drench to the mushroom bed surface in at least 12.5 gallons of water per 1,000 sq. ft. of bed surface. Make two applications. Apply the high rate in the first application and the low rate in the second application. The first application should be made within two days after top-dressing the spawn-colonized mushroom compost with a casing layer. The second application should be made at pinning. Make no more than two applications per cropping cycle. Do not apply more than 0.4 lbs active ingredient chlorothalonil per 1,000 sq. ft. per cropping cycle.					
Onion (dry bulb), Garlic <b>15.0 lbs a.i./A</b>	7	Botrytis leaf blight or blast, Purple blotch	1½ to 3 pints	ECHO is recommended for use with disease monitoring systems which adjust fungicide rates and frequency of application according to disease hazard. Apply as follows:					
					<table border="1"> <tr> <td>Low Disease Hazard &amp; Prior to Infection</td> <td>Low Disease Hazard &amp; Some Disease Present</td> <td>High Disease Hazard</td> </tr> <tr> <td>1 ½ pints</td> <td>2 pints</td> <td>3 pints</td> </tr> <tr> <td>10 days</td> <td>7 to 10 days</td> <td>7 days</td> </tr> </table>	Low Disease Hazard & Prior to Infection	Low Disease Hazard & Some Disease Present	High Disease Hazard	1 ½ pints
Low Disease Hazard & Prior to Infection	Low Disease Hazard & Some Disease Present	High Disease Hazard							
1 ½ pints	2 pints	3 pints							
10 days	7 to 10 days	7 days							
		Neck rot	2 to 3 pints	For suppression of neck rot ( <i>Botrytis</i> spp.) during storage, make a minimum of three weekly applications prior to lifting.					

<p>Onion (green bunching), Leek, Shallot, Onion grown for seed <b>6.7 lbs a.i./A</b></p>	<p>14 (green onion, leek, shallot)</p>	<p>Botrytis leaf blight or blast, Purple blotch, Downy mildew (suppression)</p>	<p>2 to 4¼ pints</p>	<p>Begin applications prior to favorable infection periods, and repeat at 7 to 10 day intervals for as long as conditions favor disease. Use the high rate and a 7 day schedule of applications when heavy dew or rain persist. If additional disease control is needed before harvest, use another registered fungicide.</p>
<p>Parsnip <b>6.0 lbs a.i./A</b></p>	<p>10</p>	<p>Alternaria leaf spot, Downy mildew, Anthracnose, Botrytis blight (gray mold), Bottom rot (Rhizoctonia)</p>	<p>2 to 3 pints</p>	<p>Make the first application at the first sign of disease or when conditions are favorable for infection. Continue applications on a 7 to 10 day schedule.</p>
<p>Peanut <b>9.0 lbs a.i./A</b> Chemigation OK</p>	<p>14</p>	<p>Early leafspot (Cercospora) Late leafspot (Cercosporidium), Rust, Web blotch</p>	<p>1½ to 2-1/8 pints 2-1/8 pints</p>	<p>Apply in sufficient water for coverage when leaf wetness first occurs or 30 to 40 days after planting; repeat at 14 day intervals. Do not allow livestock to graze in treated areas. Do not feed hay or threshings from treated fields to livestock.</p>
<p>Potato <b>11.25 lbs a.i./A</b> Chemigation OK</p>	<p>7</p>	<p>Late blight, Early blight, Botrytis vine rot, Black dot</p>	<p>1 pint -- Then -- 1½ to 2-1/8 pints</p>	<p>Begin applications at the low rate when vines are first exposed and leaf wetness occurs. Repeat applications at 7 to 10 day intervals. Begin applying the higher label rates at 5 to 10 day intervals when any one of the following events occur:</p> <ul style="list-style-type: none"> <li>▪ Vines close within the rows;</li> <li>▪ Late blight forecasting measures 18 disease severity values (DSV);</li> <li>▪ The crop reaches 300 P-days</li> </ul> <p>Increase water spray volume as canopy density increases. Use the highest rate and shortest interval when plants are rapidly growing and disease conditions are severe.</p>

		See tables below for rates and timing of applications. Use the three application program in areas having a history of moderate to severe disease intensity. Do not feed soybean hay or threshings from treated fields to livestock.		
		Determinate southern varieties	Determinate southern varieties	Indeterminate northern varieties
Soybean 4.5 lbs a.i./A Chemigation OK	42	Anthracnose, Diaporthe pod & stem blight, Frogeye leaf spot ( <i>Cercospora soja</i> ), Purple seed stain, Cercospora leaf blight ( <i>Cercospora kikuchii</i> ), Septoria brown spot, Rust ( <i>Phakopsora pachyrhizi</i> )	2-Application Program 3-Application Program	Pods 1 – 1½ inches Then 14 days later One week after first flowering, then at 14 day intervals
		Stem canker ( <i>Diaporthe phaseolorum</i> var. <i>caulivora</i> )	1½ pints	Apply in 10 to 20 gallons of water per acre, as a band treatment directing spray to provide coverage of entire plant. Make the application at time of emergence of the second trifoliolate leaves (V2). If conditions favor stem canker disease make a second and third application at 14 day intervals.
Tomato 15.1 lbs a.i./A Chemigation OK; solid set or portable wheel move systems only	0	FOLIAGE (apply every 7-10 days): Early blight, Late blight, Gray leaf spot, Gray leaf mold, Septoria leaf spot, Target spot	2 to 3 pints	Begin applications when dew or rain occur and disease threatens. Use the highest rate and shortest interval specified when disease conditions are severe.
		FRUIT (apply every 7-14 days beginning at fruit set): Anthracnose, Alternaria fruit rot (black mold), Botrytis gray mold, Late blight fruit rot, Rhizoctonia fruit rot	3 to 4 pints	ECHO may be combined in the spray tank with EPA-registered pesticide products that claim copper as the active ingredient and are labeled for control of bacterial diseases of tomatoes. Check the copper manufacturer's label for specific instructions, precautions and limitations prior to mixing with ECHO.

## TREE AND ORCHARD CROPS

Apply this product in sufficient water and with proper calibration to obtain uniform coverage of tree canopy. Application with ground equipment is preferable to aerial application because ground applications generally give better coverage of the tree canopy. If application with ground equipment is not feasible, this product may be applied with aircraft using at least 20 gallons of spray per acre. When concentrate sprays are used or when treating non-bearing or immature trees, use the lower rate of this product listed for the crop being treated.

DO NOT allow livestock to graze in treated areas.

**DO NOT apply Echo within one week before or after application of oil or an oil-based pesticide.**

Crop	PHI (days)	Diseases	RATE PER Acre	Spray Volume (gallons/acre)	Application Directions
Blueberry <b>9.0 lbs a.i./A</b>	42	Mummy Berry, Anthracnose	4¼ to 5¾ pints	20 (concentrate) to 100 (full dilute)	Begin applications at budbreak (green tip). Repeat applications until early bloom at 10 day intervals. DO NOT apply after early bloom, otherwise phytotoxicity may occur to the developing fruit.
Filberts (-Hazlenuts) <b>9.0 lbs a.i./A</b>	120	Eastern filbert blight	5¾ pints	20 (concentrate) to 400 (full dilute)	Begin applications at leaf bud break and repeat at 2 to 4 week intervals. Based on available residue data, use of this product on filberts is restricted to Oregon.
Mango <b>24.0 lbs a.i./A</b>	21	Anthracnose	3 to 5 pints	100 (full dilute)	Begin applications at early bloom and repeat at 7 to 14 day intervals until early fruit development. Use the high rate and apply weekly when conditions favor disease.
Papaya <b>6.75 lbs a.i./A</b>	14	Alternaria fruit spot, Anthracnose, Stem end rot	3 to 4 pints	20 (concentrate) to 150 (full dilute)	Apply with ground equipment only. Begin treatment when conditions favor development of disease and continue treatments at 14 day intervals until weather conditions no longer favor disease development.
Passion Fruit (-Hawaii only) <b>7.5 lbs a.i./A</b>	7	Alternaria fruit and leaf spot (brown spot)	3 pints	20 (concentrate) to 100 (full dilute)	Apply with ground equipment in sufficient water to obtain adequate coverage of fruit and leaves. Begin applications before fruit spots appear (April to July) and re-apply at 14 day intervals until weather conditions no longer favor disease development.



<p>Single application technique: In Christmas tree plantations make one application in the spring when new shoot growth is 1/2 to 2 inches in length.</p>		
<p>Make the first application in spring when new shoot growth is 1/2 to 2 inches in length. Make additional applications at 3 to 4 week intervals until conditions no longer favor disease development. For use in nursery beds, apply the highest rate specified on a 3 week schedule.</p>		
<p>Apply in early spring prior to budbreak. Repeat applications at approximately 6 to 8 week intervals, until spore release ceases in late fall. Apply monthly during periods of frequent rainfall, and where Lophodermium infections occur during dormancy (Pacific Northwest). During drought periods, applications may be suspended, then resumed upon next occurrence of needle wetness.</p>	<p>5 to 10 (concentrate ground or aircraft) to 100 (dilute)</p>	
<p>Apply at budbreak and repeat at 3 to 4 week intervals until needles are fully elongated and conditions no longer favor disease development. In plantations of mixed provenance, or when irregular budbreak occurs, apply weekly until all trees have broken bud, then every 3 to 4 weeks as specified above. In nursery beds, use the high rate on a 3 week schedule.</p>		
<p>Begin applications in nursery beds when seedlings are 4 inches tall and when cool, moist conditions favor disease development. Make additional applications at 7 to 14 day intervals as long as disease favorable conditions persist.</p>		
<p>Begin applications when 10% of buds have broken and repeat twice thereafter at 7-10 day intervals.</p>		
<p>Apply only to conifers in: conifer nursery beds, Christmas tree and bough production plantations, tree seed orchards and landscape situations. <b>Do not use on forests.</b></p>		

## TURFGRASSES

Do not use on home lawns and turf sites associated with apartment buildings, daycare centers, playgrounds, recreational park athletic fields, athletic fields located on or next to schools (i.e., elementary, middle and high schools), campgrounds, churches, and theme parks. Sodfarm turf treated with chlorothalonil prior to harvest must be mechanically cut, rolled and harvested. Do not use for sodfarms at application rates greater than 13 pounds of active ingredient, per acre, per year. Do not apply more than the following totals of chlorothalonil active ingredient from all registered product sources to the indicated types of turfgrass:

TYPE OF TURFGRASS	TOTAL CHLOROTHALONIL ACTIVE INGREDIENT PER ACRE PER YEAR
Golf Course Greens	<b>73 lbs</b>
Golf Course Tees	<b>52 lbs</b>
Golf Course Fairways	<b>26 lbs</b>
Sod Farms	<b>13 lbs</b>
Other Turf	<b>26 lbs</b>

Apply ECHO in 90 to 450 gallons of water per acre on golf course greens and tees, and 30 to 100 gallons of water per acre on fairways, lawns and other turfgrass. Apply with ground equipment only.

Begin applications when conditions favor disease development and repeat applications as long as these conditions persist. Under severe disease conditions use the highest rate and shortest interval corresponding with the application schedule selected from the table below. DO NOT mow or irrigate after treatment until spray deposit on turfgrass is thoroughly dry. ECHO should always be used in conjunction with good turf management practices.

DISEASES* CONTROLLED	INTERVAL OF APPLICATION	GOLF COURSE GREENS & TEES RATE PER 1,000 SQ.FT.	GOLF COURSE FAIRWAYS, LAWNS & OTHER TURFGRASS RATE PER ACRE
1. Dollar spot 2. Brown patch 3. Leaf spot, Melting-out, Brown blight 4. Gray leaf spot	7-14 days	3 to 5 fluid ounces (4.1 to 7.3 lbs a.i./acre)	8 to 14 pints (4.1 to 7.3 lbs a.i./acre)
5. Red thread 6. Anthracnose 7. Copper spot	7 days or	5 fluid ounces (7.3 lbs a.i./acre) or	14 pints (7.3 lbs a.i./acre) or
8. Stem rust (bluegrass) 9. Dichondra leaf spot	14 days	8 fluid ounces (11.3 lbs a.i./acre)	22 pints (11.3 lbs a.i./acre)

\*Diseases listed are caused by fungi, some of which are named as follows:

1. Dollar spot: *Sclerotinia homeocarpa*; *Lanzia* or *Moellerodiscus* spp.
2. Brown patch: *Rhizoctonia solani*, *R. zaeae*, *R. cerealis*
3. Leaf spots, Melting-out, Brown blight: *Drechslera* spp. (including *D. poae*, *D. siccans*), *Bipolaris sorokiniana*, *Curvularia* spp.
4. Gray leaf spot: *Pyricularia grisea*, *P. oryzae*
5. Red thread: *Laetisaria fuciformis*
6. Anthracnose: *Colletotrichum graminicola*

7. Copper spot: *Gloeocercospora sorghi*
8. Stem rust: *Puccinia graminis*
9. Dichondra leaf spot: *Alternaria spp.*

**Gray Snow Mold** caused by *Typhula spp.*: Apply in sufficient water to obtain adequate coverage (2 to 10 gallons per 1,000 square feet). Apply 8 fluid ounces of ECHO Zn per 1,000 square feet of turf area (22 pints per acre). Application must be made before snow cover in autumn. If snow cover is intermittent or lacking during the winter, re-apply ECHO at monthly intervals until Gray Snow Mold conditions no longer prevail. In areas where Pink Snow Mold (*Microdochium* or *Fusarium* patch) is likely to occur, apply ECHO Zn at 8 fluid ounces in combination with products containing iprodione at 2 ounces active ingredient, per 1,000 square feet of turf area. Read and observe all label directions for products containing these active ingredients.

**Fusarium (Microdochium) Patch**: ECHO is effective against Fusarium patch only in areas where snow cover is intermittent or lacking during the winter. Apply 8 fluid ounces of ECHO Zn per 1,000 square feet of turf area. Begin applications in late autumn and re-apply at 21 to 28 day intervals until conditions favorable for Fusarium patch no longer prevail.

**Algal scum**: Apply ECHO Zn at 3 to 5 fluid ounces per 1,000 square feet on a 7 to 14 day schedule. When colonies of algae are well established, every attempt should be made to dry out the afflicted area. Once dry, spiking or verticutting should be done to enhance turfgrass recovery in conjunction with the use of ECHO. Several applications of ECHO at the high rate may be necessary for turfgrass recovery. When environmental conditions are favorable for algae growth, a preventive program with ECHO will suppress re-colonization of the turf.

## ORNAMENTAL PLANTS

Apply ECHO Zn at a rate of 2 pints per 100 gallons of water unless other directions are given in the tables below. Apply enough diluted spray per acre to provide thorough coverage of all plant parts that are intended to be protected from disease, generally ranging from 20 to 150 gallons per acre. Repeat applications at 7 to 14 day intervals until conditions are no longer favorable for disease. During periods when conditions favor severe disease incidence, generally cloudy or wet weather, apply ECHO at 7 day intervals. **DO NOT apply more than a total of 36.4 lbs chlorothalonil active ingredient per acre per growing season on field-grown ornamentals.**

Fruits and other structures which may be borne on treated plants **MUST NOT BE EATEN.**

This product may be used in greenhouses. **DO NOT** use mistblowers or high pressure spray equipment when making applications of this product in greenhouses.

ECHO is recommended for control of fungal diseases referred to by numbers in parentheses following each type of ornamental plant. The user should test for possible phytotoxic responses, using recommended rates on each type of ornamental plant on a small area prior to widespread use. Applications made during bloom may damage flowers and/or fruits.

## ORNAMENTALS RECOMMENDED FOR TREATMENT WITH ECHO

Broadleaf Shrubs and Trees	
Andromeda ( <i>Pieris</i> ) (4)	Holly (1)
Ash ( <i>Fraxinus</i> ) (1)	Lilac (5)
Aspen (1)	Magnolia (1)
Azalea (1,2,4)	Maple (1)
Buckeye, Horsechestnut (1)	Mountain laurel (1)
Camellia (2)	Oak (red group only) (1,7)
Cherry-laurel (1)	Oregon-grape ( <i>Mahonia</i> ) (6)
Crabapple (1,6)	Red-tip ( <i>Photinia</i> ) (1)
Dogwood (1)	Poplar (1)
Eucalyptus (3)	Privet ( <i>Ligustrum</i> ) (1)
Euonymus (1)	Rhododendron (1,2,4)
Firethorn ( <i>Pyracantha</i> ) (1)	Sand cherry (1,2)
Flowering almond (1,2)	Sequoia (1)
Flowering cherry (1,2)	Spirea (1)
Flowering peach (1,2)	Sycamore, Planetree (1)
Flowering plum (1,2)	Viburnum (5)
Flowering quince (1,2)	Walnut ( <i>Juglans</i> ) (1)
Hawthorn (1,6)	

Flowering <sup>a</sup> Plants and Bulbs	
Arabian violet (2)	Lily (1)
Begonia (1)	Marigold (1)
Carnation (1,2)	Narcissus (1)
Chrysanthemum (1,2)	Pansy (1)
Crocus (1)	Petunia (1,4)
Daffodil (1)	Phlox (1)
Daisy (1)	Poinsettia <sup>b</sup> (1)
Geranium (1,6)	Rose <sup>c</sup> (1)
Gladiolus (1,2)	Statice (1)
Hollyhock (6)	Tulip (1)
Hydrangea (foliage only) (1,6)	Zinnia (1,5)
Iris (1,2)	

a/ Avoid applications during bloom period on plants where flower injury is unacceptable.

b/ Discontinue applications prior to bract formation; phytotoxicity is possible on the bracts.

c/ Use 1½ pints of ECHO Zn per 100 gallons of water.

Foliage Plants	
Aglaoriema (1)	Lipstick plant (1)
Areca palm (1)	Ming aralia (1)
Artemesia (1)	Oyster plant ( <i>Rhoeo</i> ) (1)
Boston fern ( <i>Nephrolepis</i> ) (1)	Pachysandra <sup>d</sup> (1)
Dracaena (1)	Parlor palm ( <i>Chamaedorea</i> ) (1)
Dumbcane ( <i>Dieffenbachia</i> ) (1)	Peperomia (1)
Fatsia ( <i>Aralia</i> ) (1)	Philodendron (1,4)
Ficus (1)	Prayer plant ( <i>Maranta</i> ) (1)
Florida ruffe fern (1)	Syngonium (1)
Leatherleaf fern (1)	Zebra plant ( <i>Aphelandra</i> ) (1)

d/ Use 4 pints of ECHO Zn per 100 gallons of water.

**Diseases controlled with ECHO:**

<b>1. Leafspots &amp; Foliar Blights:</b>	
Actinopelte leafspot Alternaria leafspot or leaf blight Anthracnose ( <i>Gnomonia, Glomerella, Colletotrichum, Discula</i> ) blights Black spot ( <i>Diplocarpon</i> ) Botrytis blights Cephalosporium leafspot Cercospora leafspot Cercosporidium leafspot Shothole ( <i>Stigmina</i> ) Corynespora stem & leafspots Curvularia leafspot Dactylaria leafspot Didymellina leafspot Drechslera ( <i>Bipolaris</i> ) leafspots, inkspot	Fabraea ( <i>Entomosporium</i> ) leafspot Fusarium ( <i>Gibberella</i> ) leafspot Gloeosporium black leafspot Marssonina leafspot Monilinia blossom blight, twig blight Mycosphaerella ray blight Myrothecium leafspot, brown rot Phyllosticta leafspot Ramularia leafspot Rhizoctonia web blight Scab ( <i>Venturia</i> ) Septoria leafspot Sphaeropsis leafspot Stagonospora leaf scorch Tan leafspot ( <i>Curvularia</i> ) Volutella leaf blight
<b>2. Flower Spots &amp; Blights:</b>	
Botrytic flower spot, flower blight Curvularia flower spot Monilinia blossom blight	Ovulinia flower blight Rhizopus blossom blight Sclerotinia flower blight
<b>3. Cylindrocladium stem canker</b>	
<b>4. Phytophthora leaf blight, dieback</b>	
<b>5. Powdery mildews:</b>	
<i>Erysiphe cichoracearum</i> <i>Sphaerotheca fuliginea</i>	<i>Microsphaera</i> spp.
<b>6. Rusts:</b>	
<i>Gymnosporangium</i> spp. <i>Pucciniastrum hydrangeae</i>	<i>Puccinia</i> spp.
<b>7. Taphrina blister</b>	

## STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** Store in a cool place. Protect from excessive heat.

**Pesticide Disposal:** Pesticide wastes are toxic. Improper disposal of excess pesticide, pesticide spray or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use 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:**

**Non-Bulk Containers:** Non-refillable Container. Do not use or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or, by incineration, or by other procedures approved by state and local authorities.

**Triple rinse containers small enough to shake (capacity  $\leq$  5 gallons) 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  $\frac{1}{4}$  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.

**Triple rinse containers too large to shake (capacity  $>$  5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container  $\frac{1}{4}$  full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container on its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

**Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Bulk Containers:** Refillable Container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. When the container is empty, replace the cap and seal all openings that have been opened during use; and return to the point of purchase, or to a designated location named at the time of purchase of this product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. Do not transport if this container is damaged or leaking. If the container is damaged or leaking, call Chem-Trec. If the container is damaged and leaking or material has been spilled, follow these procedures:

- Cover spill with absorbent material.
- Sweep into disposal container.
- Wash area with detergent and water and follow with clean water rinse.
- Do not allow to contaminate water supplies.
- Dispose of according to instructions.

If not returned to the point of purchase or to a designated location, clean empty container as instructed above and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

### **WARRANTY AND LIMITATION OF DAMAGES**

**CONDITIONS OF SALE:** To the extent consistent with applicable law, Sipcam Agro USA, Inc. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in accordance with the directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal use conditions, or under conditions not reasonably foreseeable to Sipcam Agro USA, Inc. **SIPCAM AGRO USA, INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.** To the extent consistent with applicable law, **SIPCAM AGRO USA, INC. SHALL NOT BE LIABLE FOR CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, AND SIPCAM AGRO USA, INC.'S SOLE LIABILITY AND BUYER'S AND USER'S EXCLUSIVE REMEDY SHALL BE LIMITED TO THE REFUND OF THE PURCHASE PRICE. BUYER AND USER ACKNOWLEDGE AND ASSUME ALL RISKS AND LIABILITY RESULTING FROM HANDLING, STORAGE AND USE OF THIS PRODUCT. SIPCAM AGRO USA, INC. DOES NOT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE ANY OTHER WARRANTY, GUARANTEE OR REPRESENTATION CONCERNING THIS PRODUCT.**

120112 Conifers

# Echo<sup>®</sup> Zn

## Agricultural Fungicide

Application Type

# AG

Agricultural

Application Type

# T/O

Turf & Ornamental

**ACTIVE INGREDIENT:**

Chlorothalonil (tetrachloroisophthalonitrile) ..... 38.5%

**OTHER INGREDIENTS:** ..... 61.5%

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

Contains 4.17 Pounds Chlorothalonil Per Gallon (500 grams per liter)

## 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.)

### FIRST AID

<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 further treatment advice.</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 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>
<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 affected person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
<b>EMERGENCY PHONE NUMBERS</b>	(800) 858-7378 NPIC (human and animal health) (800) 424-9300 CHEMTREC (transportation and spills)
<b>NOTES TO PHYSICIAN:</b> Probable mucosal damage may contraindicate the use of gastric lavage. Persons having a temporary allergic reaction respond to treatment with antihistamines or steroid creams and/or systemic steroids.	

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

EPA REG. NO. 60063-4

EPA EST. NO. 70815-GA-001 (Lot No. begins with CB)  
EPA EST. NO. 086555-MO-001 (Lot No. begins with AF)  
EPA EST. NO. 070989-AR-001 (Lot No. begins with OS)

MANUFACTURED FOR SipcamAgro USA, Inc.  
2525 Meridian Parkway, Suite 350, Durham, NC 27713



SipcamAdvan

# PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS WARNING - AVISO

May be fatal if inhaled. Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Do not breathe spray mist. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

## Personal Protective Equipment (PPE):

**Mixers, loaders, applicators and all other handlers must wear:**

- Long-sleeved shirt and long pants;
- Shoes plus socks;
- Protective eye wear;
- Chemical resistant gloves made of waterproof material (some of the materials that are chemical-resistant to this product are barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyethylene, polyvinyl chloride, or viton; If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart);
- A NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any N, R, P, or HE prefilter.

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. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. DO NOT reuse them.

## Engineering Controls:

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

## USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove contaminated clothing and wash clothing before reuse.

## ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates and wildlife. DO NOT apply directly to water or to areas where surface water is present or to intertidal areas below the mean high-water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. DO NOT contaminate water when disposing of equipment washwater or rinsate.

Chlorothalonil can contaminate surface water through spray drift. DO NOT apply when weather conditions favor drift from treated areas. Under some conditions, it may also have a high potential for runoff into surface water for several days to weeks after application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlaying extremely shallow ground water, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas over-laying tile drainage systems that drain to surface water.

Chlorothalonil degradates are known to leach through soil into ground water under certain conditions as a result of label use. Use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

## DIRECTIONS FOR USE

Zinc is incorporated into this formulation as a micronutrient to provide plants with zinc required for growth.

## General Precautions and Restrictions

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, or pets, either directly or through drift. Only protected handlers may be in the area during applications. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard (WPS), 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 (REI). 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 REI of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, chemical resistant gloves made of waterproof material, shoes plus socks, and protective eyewear.

Special Eye Irritation Provisions: This product is a severe eye irritant. Although the restricted-entry interval expires after 12 hours, for the next 61/2 days entry is permitted only when the following safety measures are provided:

At least one container designed specifically for flushing eyes must be available in operating condition at the WPS-required decontamination site intended for workers entering the treated area.

Workers must be informed, in a manner they can understand:

- that residues in the treated area may be highly irritating to their eyes;
- that they should take precautions, such as refraining from rubbing their eyes, to keep the residues out of their eyes;
- that if they do get residues in their eyes, they should immediately flush their eyes using the eyeflush container that is located at the decontamination site or using other readily available clean water; and
- how to operate the eyeflush container.

This product must not be applied within 150 feet (for aerial and air-blast applications), or 25 feet (for ground applications) from marine/estuarine water bodies unless there is an untreated buffer area of that width between the area to be treated and the water body.

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

1. The distance of the outer most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

## AERIAL DRIFT ADVISORY INFORMATION

### INFORMATION ON DROPLET SIZE

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

### CONTROLLING DROPLET SIZE

- Volume- Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure- Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of nozzles- Use the minimum number of nozzles that provide uniform coverage.
- Nozzle orientation- Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- Nozzle type- Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift potential.

### BOOM LENGTH

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

### APPLICATION HEIGHT

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

### SWATH ADJUSTMENT

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

## WIND

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

## TEMPERATURE AND HUMIDITY

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

## TEMPERATURE INVERSIONS

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

## INTEGRATED PEST MANAGEMENT

ECHO is an excellent disease control agent when used according to label directions for control of a broad spectrum of plant diseases. ECHO is recommended for use in programs that are compatible with the principles of Integrated Pest Management (IPM), including the use of disease resistant crop varieties, cultural practices, pest scouting and disease forecasting systems which reduce unnecessary applications of pesticides.

## FUNGICIDE RESISTANCE MANAGEMENT

ECHO is effective for strategic use in programs that attempt to minimize disease resistance to fungicides. Some other fungicides which are at risk from disease resistance exhibit a single-site mode of fungicidal action. ECHO, with a multi-site mode of action, may be used to delay or prevent the development of resistance to single-site fungicides. Consult with your federal or state Cooperative Extension Service representatives for guidance on the proper use of ECHO in programs which seek to minimize the occurrence of disease resistance to other fungicides.

## MIXING, LOADING AND APPLYING

ECHO is intended to be diluted into water, then applied to crops by typical agricultural spraying techniques. **Always apply ECHO in sufficient water to obtain thorough, uniform coverage of foliage and crop surfaces intended to be protected from disease.** Spray volume to be used will vary with crop and amount of plant growth. Spray volume should normally range from 20 to 150 gallons per acre (200 to 1400 liters per hectare) for dilute sprays and 5 to 10 gallons per acre (50 to 100 liters per hectare) for concentrate ground sprays and aircraft applications. Both ground and aircraft methods of application are recommended unless specific directions are given for a crop. Slowly invert container several times to assure uniform mixture. Measure the required amount of ECHO and pour into the spray tank during filling. Keep agitator running when filling spray tank and during spray operations.

Do not use on greenhouse-grown crops except as directed in the Ornamental Plants section of this label.

## TANK MIXING

When tank mixing this product with other pesticides observe the more restrictive label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing.

Do not combine ECHO in sprayer tank with pesticides, surfactants or fertilizers, unless your prior use has shown the combination physically compatible, effective and noninjurious under your conditions of use. Do not combine ECHO with Dipel 4L, Foil, Triton AG-98, Triton B-1956 or Latron B-1956, as phytotoxicity may result from the combination when applied to the crops on this label. DO NOT tank mix Echo with oil, or with any adjuvants which contain oil as their principal ingredient. When an adjuvant is to be used with this product, Sipcam Advan USA recommends the use of a Chemical Producers and Distributors Association (CPDA) certified adjuvant. Do not use with Copper-Count N in concentrated spray suspensions.

Dipel is a registered trademark of Abbott Laboratories;

Foil is a registered trademark of Ecogen, Inc.;

Latron and B-1956 are trademarks of Rohm and Haas Company;

Copper-Count is a registered trademark of Mineral Research and Development Corporation.

## APPLICATIONS THROUGH SPRINKLER IRRIGATION SYSTEMS (CHEMIGATION)

Application through sprinkler irrigation systems is recommended only for those specific crops for which the notation "chemigation OK" is listed on this label.

Apply this product only through center pivot, motorized lateral move, traveling gun, solid set and portable (wheel move, side roll, end tow, or hand move) irrigation system(s). 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, you should contact State Extension Service specialists, equipment manufacturers or other experts.

DO NOT apply this product through irrigation systems connected to a public water system. '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 per year.

Controls for both irrigation water and pesticide injection systems must be functionally interlocked, so as to automatically terminate pesticide injection when the irrigation water pump motor stops. A person knowledgeable of the irrigation system and responsible for its operation shall be present so as to discontinue pesticide injection and make necessary adjustments, should the need arise.

The irrigation water pipeline must be fitted with a functional, automatic, quick-closing check valve to prevent the flow of treated irrigation water back toward the water source. The pipeline must also be fitted with a vacuum relief valve and low pressure drain, located between the irrigation water pump and the check valve, to prevent back-siphoning of treated irrigation water into the water source.

Always inject ECHO into irrigation water after it discharges from the irrigation pump and after it passes through the check valve. Never inject pesticides into the intake line on the suction side of the pump.

Pesticide injection equipment must be fitted with a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump. Interlock this valve to the power system, so as to prevent fluid from being withdrawn from the chemical supply tank when the irrigation system is either automatically or manually turned off.

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 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.

Spray mixture in the chemical supply tank must be agitated at all times, otherwise settling and uneven application may occur. DO NOT apply when wind speed favors drift beyond the area intended for treatment.

ECHO may be used through two basic types of sprinkler irrigation systems as outlined in Sections A and B below. Determine which type of system is in place, then refer to the appropriate directions provided for each type.

### **A. CENTER PIVOT, MOTORIZED LATERAL MOVE AND TRAVELING GUN IRRIGATION EQUIPMENT**

For injection of pesticides, these continuously moving systems must use a metering pump, such as a positive displacement injection pump of either diaphragm or piston type, constructed of materials that are compatible with pesticides, fitted with a system interlock, and capable of injection at pressures approximately 2 to 3 times those encountered within the irrigation water line. Venturi applicator units cannot be used on these systems.

Fill chemical supply tank of injection equipment with water. Operate system for one complete revolution or run across the field, measuring time required, amount of water injected, and acreage covered. Thoroughly mix recommended amount of ECHO for acreage to be covered into same amount of water used during calibration and inject into system continuously for one revolution or run. Mixture in the chemical supply tank must be continuously agitated during the injection run. Shut off injection equipment after one revolution or run, but continue to operate irrigation system until ECHO has been cleared from last sprinkler head.

### **B. SOLID SET AND PORTABLE (WHEEL MOVE, SIDE ROLL, END TOW, OR HAND MOVE) IRRIGATION EQUIPMENT**

With stationary systems, an effectively designed in-line venturi applicator unit is preferred which is constructed of materials that are compatible with pesticides; however, a positive-displacement pump can also be used.

Determine acreage covered by sprinkler. Fill tank of injection equipment with water and adjust flow to use contents over a thirty to forty-five minute period. Mix desired amount of ECHO for acreage to be covered with water so that the total mixture of ECHO plus water in the injection tank is equal to the quantity of water used during calibration and operate entire system at normal pressures recommended by the manufacturer of injection equipment used for amount of time established during calibration. No agitation should be required. ECHO can be injected at the beginning or end of the irrigation cycle or as a separate application. Stop injection equipment after treatment is completed and continue to operate irrigation system until ECHO has been cleared from last sprinkler head.

### **APPLICATION RATES**

Dosage rates on this label indicate pints of ECHO Zn per acre, unless otherwise stated. Under conditions favoring disease development, the high rate specified and shortest application interval should be used.

For each listed crop, the maximum total amount of chlorothalonil active ingredient (lbs a.i./A) which may be applied per acre of that crop (or crop group) during each growing season is given in bold print within a box beneath the crop name. For each crop use situation listed below, the listed maximum individual and seasonal application rates must not be exceeded and the listed minimum retreatment intervals must not be decreased.

## FIELD AND ROW CROPS

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	APPLICATION DIRECTIONS
Asparagus <b>9.0 lbs a.i./A</b>	190 (120 in California)	Rust, Purple spot, Cercospora leaf blight	3 to 5¼ pints	Begin applications after harvest of spears, when conditions favor disease development on ferns, generally when leaf wetness occurs. Repeat applications at 2 to 4 week intervals until ferns are no longer productive. Use the high rate and shortest interval when conditions favor disease.
Bean (Snap) <b>9.0 lbs a.i./A</b>	7	Rust  Botrytis blight (gray mold)	2 to 4¼ pints  4¼ pints	Begin applications during early bloom stage or when disease first threatens and repeat at 7 day intervals or as necessary to maintain control.
Beans (Dry) <b>6.0 lbs a.i./A</b>  <b>Chemigation OK</b>	14	Rust, Anthracnose, Downy mildew, Cercospora leaf spot (blackeye only), Ascochyta blight	2 to 3 pints	Begin applications during early bloom stage and repeat at 7 to 10 day intervals. For use only on beans to be harvested dry with pods removed.
Cabbage, Chinese Cabbage (tight-headed varieties only), Cauliflower, Broccoli, Chinese Broccoli, Brussels Sprouts <b>12.0 lbs a.i./A</b>	7	Alternaria leaf spot, Downy mildew  Ring spot	2¼ pints  2¼ pints	Begin applications after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development. Repeat at 7 to 10 day intervals or as necessary to maintain control.
Carrot <b>15.0 lbs a.i./A</b>  <b>Chemigation OK</b>	0	Cercospora (Early) blight, Alternaria (Late) blight	2¼ to 2¾ pints	Start applications when disease threatens and repeat at 7 to 10 day intervals or as necessary to maintain control.
Celery <b>18.0 lbs a.i./A</b>  <b>Chemigation OK</b>	7	Cercospora (Early) blight, Septoria (Late) blight, Basal stalk rot ( <i>Rhizoctonia solani</i> )	Start applications shortly after crop emergence or when transplants are set in the field. For the indicated rates, re-apply at:  1½ to 2¼ pints  3 to 4¼ pints	3 to 5 day intervals  7 day intervals
Corn (sweet), Corn grown for seed <b>9.0 lbs a.i./A</b>	14	Helminthosporium leaf blights, Rust	1½ to 2¾ pints	Begin applications when conditions favor disease development and repeat at 7 day intervals. Do not allow livestock to graze in treated fields. Do not ensile treated corn or use as livestock forage. Do not apply to sweet corn to be processed.

(continued)

## FIELD AND ROW CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	APPLICATION DIRECTIONS
Cranberry <b>15.0 lbs a.i./A</b> Chemigation OK; solid set systems only	50	Upright dieback, Fruit rots, Lophodermium leaf & twig blight	6 to 10 pints	Apply at shoot emergence to early bloom and repeat at 10 to 14 day intervals. Under severe disease conditions use the high rate on a 10 day schedule. DO NOT apply to bogs when flooded or allow release of irrigation water from bogs for at least 3 days following application.
Cucurbits: Cucumber, Cantaloupe, Muskmelon, Honeydew melon, Watermelon, Squash, Pumpkin <b>15.75 lbs a.i./A</b> Chemigation OK	0	Anthracnose, Downy mildew, Target spot  Cercospora leaf spot, Gummy stem blight (black rot), Alternaria leaf blight, Scab, Powdery mildew (Sphaerotheca only)	2¼ to 2¾ pints  2¾ to 4¼ pints	Begin applications when plants are in first true leaf stage or when conditions are favorable for disease development. Repeat applications at 7 day intervals. Under severe disease conditions, shorten spray interval. <b>Note:</b> Spraying mature watermelons may result in sunburn of the upper surface of the fruit. DO NOT apply ECHO to watermelons when any of the following conditions are present: 1. Intense heat and sunlight; 2. Drought conditions; 3. Poor vine canopy; 4. Other crop and environmental conditions which may be conducive to increased natural sunburn. DO NOT combine ECHO with anything except water for application to watermelons unless your prior use has shown the combination to be non-injurious to watermelons under your conditions of use.
Grasses Grown for Seed <b>4.5 lbs a.i./A</b>	14	Stem rust, Leaf rust, Stripe rust, Septoria leaf spot, Glume blotch, Bipolaris and Drechslera leaf spots  Selenophoma eyespot	1½ to 2 pints  1½ to 3 pints	Begin applications during stem elongation when conditions favor disease development. Re-apply at flag (top) leaf emergence and repeat applications at 14 day intervals. DO NOT allow livestock to graze in treated areas. Do not feed straw, seed or seed screenings to livestock.
Mint <b>3.0 lbs a.i./A</b>	80	Rust, Septoria leaf spot	2 pints	Begin applications when emerging plants are 4 to 8 inches high. Repeat applications at 7 to 10 day intervals or as necessary to maintain control. Based on available residue data, use of this product on mint is restricted to Indiana, Michigan and Wisconsin.
Mushroom beds	5 Do not apply after first break (harvest)	Verticillium brown spot and dry bubble	Rate per 1,000 sq. ft. of bed surface  4 to 8 fl. oz.	Apply as a drench to the mushroom bed surface in at least 12.5 gallons of water per 1,000 sq. ft. of bed surface. Make two applications. Apply the high rate in the first application and the low rate in the second application. The first application should be made within two days after top-dressing the spawn-colonized mushroom compost with a casing layer. The second application should be made at pinning. Make no more than two applications per cropping cycle. Do not apply more than 0.4 lbs active ingredient chlorothalonil per 1,000 sq. ft. per cropping cycle.

(continued)

## FIELD AND ROW CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	APPLICATION DIRECTIONS		
Onion (dry bulb), Garlic  <b>15.0 lbs a.i./A</b>	7	Botrytis leaf blight or blast, Purple blotch	1½ to 3 pints	ECHO is recommended for use with disease monitoring systems which adjust fungicide rates and frequency of application according to disease hazard. Apply as follows:		
				Low Disease Hazard & Prior to Infection	Low Disease Hazard & Some Disease Present	High Disease Hazard
				Rate per Acre:	1½ pints	2 pints
		Frequency:	10 days	7 to 10 days	7 days	
		Neck rot	2 to 3 pints	For suppression of neck rot ( <i>Botrytis</i> spp.) during storage, make a minimum of three weekly applications prior to lifting.		
Onion (green bunching), Leek, Shallot, Onion grown for seed <b>6.7 lbs a.i./A</b>	14 (green onion, leek, shallot)	Botrytis leaf blight or blast, Purple blotch, Downy mildew (suppression)	2 to 4¼ pints	Begin applications prior to favorable infection periods, and repeat at 7 to 10 day intervals for as long as conditions favor disease. Use the high rate and a 7 day schedule of applications when heavy dew or rain persist. If additional disease control is needed before harvest, use another registered fungicide.		
Parsnip <b>6.0 lbs a.i./A</b>	10	Alternaria leaf spot, Downy mildew, Anthracnose, Botrytis blight (gray mold), Bottom rot (Rhizoctonia)	2 to 3 pints	Make the first application at the first sign of disease or when conditions are favorable for infection. Continue applications on a 7 to 10 day schedule.		
Peanut <b>9.0 lbs a.i./A</b>  Chemigation OK	14	Early leafspot (Cercospora)	1½ to 2½ pints	Apply in sufficient water for coverage when leaf wetness first occurs or 30 to 40 days after planting; repeat at 14 day intervals. Do not allow livestock to graze in treated areas. Do not feed hay or threshings from treated fields to livestock.		
		Late leafspot (Cercosporidium), Rust, Web blotch	2½ pints			
Potato <b>11.25 lbs a.i./A</b>  Chemigation OK	7	Late blight, Early blight, Botrytis vine rot, Black dot	1 pint  — Then —  1½ to 2½ pints	Begin applications at the low rate when vines are first exposed and leaf wetness occurs. Repeat applications at 7 to 10 day intervals. Begin applying the higher label rates at 5 to 10 day intervals when any one of the following events occur: <ul style="list-style-type: none"> <li>• Vines close within the rows;</li> <li>• Late blight forecasting measures 18 disease severity values (DSV);</li> <li>• The crop reaches 300 P-days</li> </ul> Increase water spray volume as canopy density increases. Use the highest rate and shortest interval when plants are rapidly growing and disease conditions are severe.		

(continued)

## FIELD AND ROW CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	APPLICATION DIRECTIONS		
Soybean  <b>4.5 lbs a.i./A</b>  Chemigation OK	42	Anthracnose, Diaporthe pod & stem blight, Frogeye leaf spot (Cercospora soja), Purple seed stain, Cercospora leaf blight (Cercospora kikuchii), Septoria brown spot, Rust (Phakopsora pachyrhizi)		See tables below for rates and timing of applications. Use the three application program in areas having a history of moderate to severe disease intensity. Do not feed soybean hay or threshings from treated fields to livestock.		
			2 to 3½ pints	2-Application Program	Early pod set (R3) Seed formation (R5)	Determinate southern varieties Indeterminate northern varieties
			1½ to 2¼ pints	3-Application Program	Early flowering (R1) Early pod set (R3) Seed formation (R5)	Pods 1 - 1½ inches Then 14 days later
		Stem canker (Diaporthe phaseolorum var. caulivora)	1½ pints	Apply in 10 to 20 gallons of water per acre, as a band treatment directing spray to provide coverage of entire plant. Make the application at time of emergence of the second trifoliate leaves (V2). If conditions favor stem canker disease make a second and third application at 14 day intervals.		
Tomato  <b>15.1 lbs a.i./A</b>  Chemigation OK; solid set or portable wheel move systems only	0	FOLIAGE (apply every 7-10 days): Early blight, Late blight, Gray leaf spot, Gray leaf mold, Septoria leaf spot, Target spot	2 to 3 pints	Begin applications when dew or rain occur and disease threatens. Use the highest rate and shortest interval specified when disease conditions are severe.  ECHO may be combined in the spray tank with EPA-registered pesticide products that claim copper as the active ingredient and are labeled for control of bacterial diseases of tomatoes. Check the copper manufacturer's label for specific instructions, precautions and limitations prior to mixing with ECHO.		
FRUIT (apply every 7-14 days beginning at fruit set): Anthracnose, Alternaria fruit rot (black mold), Botrytis gray mold, Late blight fruit rot, Rhizoctonia fruit rot	3 to 4 pints					

## TREE AND ORCHARD CROPS

Apply this product in sufficient water and with proper calibration to obtain uniform coverage of tree canopy. Application with ground equipment is preferable to aerial application because ground applications generally give better coverage of the tree canopy. If application with ground equipment is not feasible, this product may be applied with aircraft using at least 20 gallons of spray per acre. When concentrate sprays are used or when treating non-bearing or immature trees, use the lower rate of this product listed for the crop being treated.

DO NOT allow livestock to graze in treated areas.

**DO NOT apply Echo within one week before or after application of oil or an oil-based pesticide.**

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	SPRAY VOLUME (GALLONS/ACRE)	APPLICATION DIRECTIONS
Blueberry  <b>9.0 lbs a.i./A</b>	42	Mummy Berry, Anthracnose	4¼ to 5¾ pints	20 (concentrate) to 100 (full dilute)	Begin applications at budbreak (green tip). Repeat applications until early bloom at 10 day intervals. DO NOT apply after early bloom, otherwise phytotoxicity may occur to the developing fruit.

## TREE AND ORCHARD CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	SPRAY VOLUME (GALLONS/ACRE)	APPLICATION DIRECTIONS
Filberts (Hazlenuts) <b>9.0 lbs a.i./A</b>	120	Eastern filbert blight	5¼ pints	20 (concentrate) to 400 (full dilute)	Begin applications at leaf bud break and repeat at 2 to 4 week intervals. Based on available residue data, use of this product on filberts is restricted to Oregon.
Mango <b>24.0 lbs a.i./A</b>	21	Anthracnose	3 to 5 pints	100 (full dilute)	Begin applications at early bloom and repeat at 7 to 14 day intervals until early fruit development. Use the high rate and apply weekly when conditions favor disease.
Papaya <b>6.75 lbs a.i./A</b>	14	Alternaria fruit spot, Anthracnose, Stem end rot	3 to 4 pints	20 (concentrate) to 150 (full dilute)	Apply with ground equipment only. Begin treatment when conditions favor development of disease and continue treatments at 14 day intervals until weather conditions no longer favor disease development.
Passion Fruit (Hawaii only) <b>7.5 lbs a.i./A</b>	7	Alternaria fruit and leaf spot (brown spot)	3 pints	20 (concentrate) to 100 (full dilute)	Apply with ground equipment in sufficient water to obtain adequate coverage of fruit and leaves. Begin applications before fruit spots appear (April to July) and re-apply at 14 day intervals until weather conditions no longer favor disease development.
Pistachio <b>22.5 lbs a.i./A</b>	14	Shoot & panicle blight, Blossom & shoot blight, Late blight, Leaf blight	8½ pints	50 (concentrate) to 200 (full dilute)	Apply when trees begin to blossom, then re-apply at full bloom for optimal protection against shoot and panicle blights. If conditions are favorable for late blight or leaf spot infections, repeat applications at 4 week intervals. Use the high rate when abnormally wet or cloudy weather conditions prevail. NOTE: Use of this product in the manner described may result in specking or reddening of the fruit hull (epicarp). This effect appears to be superficial, and has not resulted in any change in nut quality.
Stone Fruits: Peach, Nectarine, Apricot, Cherry, Plum, Prune <b>15.5 lbs a.i./A</b>	Do not apply after shuck split	Leaf curl	4½ to 6 pints	20 (concentrate) to 300 (full dilute)	For best control apply at leaf fall in late autumn, using sufficient water and proper sprayer calibration to obtain uniform coverage. When conditions favor high disease levels use the high rate and apply once or twice more in mid to late winter before budswell. If the leaf fall application is not practical, application of ECHO for control of leaf curl may be made at any time prior to budswell the following spring.

(continued)

## TREE AND ORCHARD CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	SPRAY VOLUME (GALLONS/ACRE)	APPLICATION DIRECTIONS
<p>Stone Fruits (continued): Peach, Nectarine, Apricot, Cherry, Plum, Prune</p> <p><b>15.5 lbs a.i./A</b></p>	<p>Do not apply after shuck split</p>	<p>Shothole, Brown rot blossom blight, Lacy (russet) scab on prune, Cherry leaf spot, Scab</p>	<p>4½ to 6 pints</p>	<p>20 (concentrate) to 300 (full dilute)</p>	<p>Make one application at budbreak or popcorn (pink, red or early white bud). If weather conditions favor disease, make a second application 10 days later (full bloom to petal fall). Apply at shuck split to prevent infections on young fruit. If additional disease control is needed after shuck split and before harvest, use another registered fungicide. For control of cherry leaf spot after harvest, make one application to foliage within 7 days after fruit is removed. In orchards with a history of high leaf spot incidence, make a second application 10-14 days later.</p>
<p>Conifers</p> <p><b>16.5 lbs a.i./A</b></p>	<p>N/A</p>	<p>Swiss needlecast</p> <p>Scleroderris canker (pines), Swiss needlecast</p> <p>Sirococcus tip blight</p> <p>Rhizosphaera needlecast (spruces), Scirrhia brown spot (pines)</p> <p>Cyclaneusma and Lophodermium needlecasts (pines)</p> <p>Rhabdocline needlecast (Douglas-fir)</p>	<p>4 to 8 pints</p> <p>2 to 4 pints</p> <p>3 to 5 pints</p> <p>8 pints</p> <p>4 to 8 pints</p> <p>2 to 4 pints</p>	<p>5 to 10 (concentrate ground or aircraft) to 100 (dilute)</p>	<p>Single application technique: In Christmas tree plantations make one application in the spring when new shoot growth is 1/2 to 2 inches in length.</p> <p>Make the first application in spring when new shoot growth is 1/2 to 2 inches in length. Make additional applications at 3 to 4 week intervals until conditions no longer favor disease development. For use in nursery beds, apply the highest rate specified on a 3 week schedule.</p> <p>Apply in early spring prior to budbreak. Repeat applications at approximately 6 to 8 week intervals, until spore release ceases in late fall. Apply monthly during periods of frequent rainfall, and where Lophodermium infections occur during dormancy (Pacific Northwest). During drought periods, applications may be suspended, then resumed upon next occurrence of needle wetness.</p> <p>Apply at budbreak and repeat at 3 to 4 week intervals until needles are fully elongated and conditions no longer favor disease development. In plantations of mixed provenance, or when irregular budbreak occurs, apply weekly until all trees have broken bud, then every 3 to 4 weeks as specified above. In nursery beds, use the high rate on a 3 week schedule.</p>

(continued)

## TREE AND ORCHARD CROPS (continued)

CROP	PHI (DAYS)	DISEASES	RATE PER ACRE	SPRAY VOLUME (GALLONS/ACRE)	APPLICATION DIRECTIONS
Conifers (continued)	N/A	Botrytis seedling blight, Phoma twig blight	4 pints	5 to 10 (concentrate ground or aircraft) to 100 (dilute)	Begin applications in nursery beds when seedlings are 4 inches tall and when cool, moist conditions favor disease development. Make additional applications at 7 to 14 day intervals as long as disease favorable conditions persist.
		Autoecious needle rust (Weir's cushion rust) (spruces)	8 pints		Begin applications when 10% of buds have broken and repeat twice thereafter at 7-10 day intervals.
Apply only to conifers in: conifer nursery beds, Christmas tree and bough production plantations, tree seed orchards and landscape situations. <b>Do not use on forests.</b>					

## TURFGRASSES

Do not use on home lawns and turf sites associated with apartment buildings, daycare centers, playgrounds, recreational park athletic fields, athletic fields located on or next to schools (ie., elementary, middle and high schools), campgrounds, churches, and theme parks. Sodfarm turf treated with chlorothalonil prior to harvest must be mechanically cut, rolled and harvested. Do not use for sodfarms at application rates greater than 13 pounds of active ingredient, per acre, per year. Do not apply more than the following totals of chlorothalonil active ingredient from all registered product sources to the indicated types of turfgrass:

TYPE OF TURFGRASS	TOTAL CHLOROTHALONIL ACTIVE INGREDIENT PER ACRE PER YEAR
Golf Course Greens	<b>73 lbs</b>
Golf Course Tees	<b>52 lbs</b>
Golf Course Fairways	<b>26 lbs</b>
Sod Farms	<b>13 lbs</b>
Other Turf	<b>26 lbs</b>

Apply ECHO in 90 to 450 gallons of water per acre on golf course greens and tees, and 30 to 100 gallons of water per acre on fairways, lawns, and other turfgrass. Apply with ground equipment only.

Begin applications when conditions favor disease development and repeat applications as long as these conditions persist. Under severe disease conditions use the highest rate and shortest interval corresponding with the application schedule selected from the table below. DO NOT mow or irrigate after treatment until spray deposit on turfgrass is thoroughly dry. ECHO should always be used in conjunction with good turf management practices.

DISEASES* CONTROLLED	INTERVAL OF APPLICATION	GOLF COURSE GREENS & TEES RATE PER 1,000 SQ.FT.	GOLF COURSE FAIRWAYS, LAWNS & OTHER TURFGRASS RATE PER ACRE
1. Dollar spot 2. Brown patch 3. Leaf spot, Melting-out, Brown blight 4. Gray leaf spot	7-14 days	3 to 5 fluid ounces (4.1 to 7.3 lbs a.i./acre)	8 to 14 pints (4.1 to 7.3 lbs a.i./acre)
5. Red thread 6. Anthracnose 7. Copper spot 8. Stem rust (bluegrass) 9. Dichondra leaf spot	7 days or	5 fluid ounces (7.3 lbs a.i./acre) or	14 pints (7.3 lbs a.i./acre) or
	14 days	8 fluid ounces (11.3 lbs a.i./acre)	22 pints (11.3 lbs a.i./acre)

\*Diseases listed are caused by fungi, some of which are named as follows:

1. Dollar spot: *Sclerotinia homeocarpa*; *Lanzia* or *Moellerodiscus* spp.
2. Brown patch: *Rhizoctonia solani*, *R. zeae*, *R. cerealis*
3. Leaf spots, Melting-out, Brown blight: *Drechslera* spp. (including *D. poae*, *D. siccans*), *Bipolaris sorokiniana*, *Curvularia* spp.
4. Gray leaf spot: *Pyricularia grisea*, *P. oryzae*
5. Red thread: *Laetisaria fuciformis*
6. Anthracnose: *Colletotrichum graminicola*
7. Copper spot: *Gloeocercospora sorghi*
8. Stem rust: *Puccinia graminis*
9. Dichondra leaf spot: *Alternaria* spp.

**Gray Snow Mold** caused by *Typhula* spp.: Apply in sufficient water to obtain adequate coverage (2 to 10 gallons per 1,000 square feet). Apply 8 fluid ounces of ECHO Zn per 1,000 square feet of turf area (22 pints per acre). Application must be made before snow cover in autumn. If snow cover is intermittent or lacking during the winter, re-apply ECHO at monthly intervals until Gray Snow Mold conditions no longer prevail. In areas where Pink Snow Mold (*Microdochium* or *Fusarium* patch) is likely to occur, apply ECHO Zn at 8 fluid ounces in combination with products containing iprodione at 2 ounces active ingredient, per 1,000 square feet of turf area. Read and observe all label directions for products containing these active ingredients.

**Fusarium (Microdochium) Patch:** ECHO is effective against *Fusarium* patch only in areas where snow cover is intermittent or lacking during the winter. Apply 8 fluid ounces of ECHO Zn per 1,000 square feet of turf area. Begin applications in late autumn and re-apply at 21 to 28 day intervals until conditions favorable for *Fusarium* patch no longer prevail.

**Algal scum:** Apply ECHO Zn at 3 to 5 fluid ounces per 1,000 square feet on a 7 to 14 day schedule. When colonies of algae are well established, every attempt should be made to dry out the afflicted area. Once dry, spiking or verticutting should be done to enhance turfgrass recovery in conjunction with the use of ECHO. Several applications of ECHO at the high rate may be necessary for turfgrass recovery. When environmental conditions are favorable for algae growth, a preventive program with ECHO will suppress re-colonization of the turf.

## ORNAMENTAL PLANTS

Apply ECHO Zn at a rate of 2 pints per 100 gallons of water unless other directions are given in the tables below. Apply enough diluted spray per acre to provide thorough coverage of all plant parts that are intended to be protected from disease, generally ranging from 20 to 150 gallons per acre. Repeat applications at 7 to 14 day intervals until conditions are no longer favorable for disease. During periods when conditions favor severe disease incidence, generally cloudy or wet weather, apply ECHO at 7 day intervals. **DO NOT apply more than a total of 36.4 lbs chlorothalonil active ingredient per acre per growing season on field-grown ornamentals.**

Fruits and other structures which may be borne on treated plants **MUST NOT BE EATEN.**

This product may be used in greenhouses. DO NOT use mistblowers or high pressure spray equipment when making applications of this product in greenhouses.

ECHO is recommended for control of fungal diseases referred to by numbers in parentheses following each type of ornamental plant. The user should test for possible phytotoxic responses, using recommended rates on each type of ornamental plant on a small area prior to widespread use. Applications made during bloom may damage flowers and/or fruits.

# ORNAMENTALS RECOMMENDED FOR TREATMENT WITH ECHO ZN

## Broadleaf Shrubs and Trees

Andromeda ( <i>Pieris</i> ) (4)	Holly (1)
Ash ( <i>Fraxinus</i> ) (1)	Lilac (5)
Aspen (1)	Magnolia (1)
Azalea (1,2,4)	Maple (1)
Buckeye, Horsechestnut (1)	Mountain laurel (1)
Camellia (2)	Oak (red group only) (1,7)
Cherry-laurel (1)	Oregon-grape ( <i>Mahonia</i> ) (6)
Crabapple (1,6)	Red-tip ( <i>Photinia</i> ) (1)
Dogwood (1)	Poplar (1)
Eucalyptus (3)	Privet ( <i>Ligustrum</i> ) (1)
Euonymus (1)	Rhododendron (1,2,4)
Firethorn ( <i>Pyracantha</i> ) (1)	Sand cherry (1,2)
Flowering almond (1,2)	Sequoia (1)
Flowering cherry (1,2)	Spirea (1)
Flowering peach (1,2)	Sycamore, Planetree (1)
Flowering plum (1,2)	Viburnum (5)
Flowering quince (1,2)	Walnut ( <i>Juglans</i> ) (1)
Hawthorn (1,6)	

## Flowering<sup>a</sup> Plants and Bulbs

Arabian violet (2)	Lily (1)
Begonia (1)	Marigold (1)
Carnation (1,2)	Narcissus (1)
Chrysanthemum (1,2)	Pansy (1)
Crocus (1)	Petunia (1,4)
Daffodil (1)	Phlox (1)
Daisy (1)	Poinsettia <sup>b</sup> (1)
Geranium (1,6)	Rose <sup>c</sup> (1)
Gladiolus (1,2)	Statice (1)
Hollyhock (6)	Tulip (1)
Hydrangea (foliage only) (1,6)	Zinnia (1,5)
Iris (1,2)	

a/ Avoid applications during bloom period on plants where flower injury is unacceptable.

b/ Discontinue applications prior to bract formation; phytotoxicity is possible on the bracts.

c/ Use 1 1/2 pints of ECHO Zn per 100 gallons of water.

## Foliage Plants

Aglaonema (1)	Lipstick plant (1)
Areca palm (1)	Ming aralia (1)
Artemesia (1)	Oyster plant ( <i>Rhoeo</i> ) (1)
Boston fern ( <i>Nephrolepis</i> ) (1)	Pachysandra <sup>d</sup> (1)
Dracaena (1)	Parlor palm ( <i>Chamaedorea</i> ) (1)
Dumbcane ( <i>Dieffenbachia</i> ) (1)	Peperomia (1)
Fatsia ( <i>Aralia</i> ) (1)	Philodendron (1,4)
Ficus (1)	Prayer plant ( <i>Maranta</i> ) (1)
Florida ruffle fern (1)	Syngonium (1)
Leatherleaf fern (1)	Zebra plant ( <i>Aphelandra</i> ) (1)

d/ Use 4 pints of ECHO Zn per 100 gallons of water.

## DISEASES CONTROLLED WITH ECHO ZN:

<b>1. Leafspots &amp; Foliar Blights:</b>	
Actinopelte leafspot Alternaria leafspot or leaf blight Anthracnose ( <i>Gnomonia</i> , <i>Glomerella</i> , <i>Colletotrichum</i> , <i>Discula</i> ) blights Black spot ( <i>Diplocarpon</i> ) Botrytis blights Cephalosporium leafspot Cercospora leafspot Cercosporidium leafspot Shothole ( <i>Stigmia</i> ) Corynespora stem & leafspots Curvularia leafspot Dactylaria leafspot Didymellina leafspot Drechslera ( <i>Bipolaris</i> ) leafspots, inkspot Fabraea ( <i>Entomosporium</i> ) leafspot	Fusarium ( <i>Gibberella</i> ) leafspot Gloeosporium black leafspot Marssonina leafspot Monilinia blossom blight, twig blight Mycosphaerella ray blight Myrothecium leafspot, brown rot Phyllosticta leafspot Ramularia leafspot Rhizoctonia web blight Scab ( <i>Venturia</i> ) Septoria leafspot Sphaeropsis leafspot Stagonospora leaf scorch Tan leafspot ( <i>Curvularia</i> ) Volutella leaf blight

<b>2. Flower Spots &amp; Blights:</b>	
Botrytis flower spot, flower blight Curvularia flower spot Monilinia blossom blight	Ovulinia flower blight Rhizopus blossom blight Sclerotinia flower blight

### 3. *Cylindrocladium* stem canker

### 4. *Phytophthora* leaf blight, dieback

<b>5. Powdery mildews:</b>	
<i>Erysiphe cichoracearum</i> <i>Sphaerotheca fuliginea</i>	<i>Microsphaera</i> spp.

<b>6. Rusts:</b>	
<i>Gymnosporangium</i> spp. <i>Pucciniastrum hydrangeae</i>	<i>Puccinia</i> spp.

### 7. *Taphrina* blister

# STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** Store in a cool place. Protect from excessive heat.

**Pesticide Disposal:** Pesticide wastes are toxic. Improper disposal of excess pesticide, pesticide spray or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use 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:** Non-refillable Container. Do not use or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or, by incineration, or by other procedures approved by state and local authorities.

**Triple rinse containers small enough to shake (capacity  $\leq$  5 gallons) 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  $\frac{1}{4}$  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.

## WARRANTY AND LIMITATION OF DAMAGES

**CONDITIONS OF SALE:** To the extent consistent with applicable law, Sipcam Agro USA, Inc. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in accordance with the directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal use conditions, or under conditions not reasonably foreseeable to Sipcam Agro USA, Inc. **SIPCAM AGRO USA, INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. To the extent consistent with applicable law, SIPCAM AGRO USA, INC. SHALL NOT BE LIABLE FOR CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, AND SIPCAM AGRO USA, INC.'S SOLE LIABILITY AND BUYER'S AND USER'S EXCLUSIVE REMEDY SHALL BE LIMITED TO THE REFUND OF THE PURCHASE PRICE. BUYER AND USER ACKNOWLEDGE AND ASSUME ALL RISKS AND LIABILITY RESULTING FROM HANDLING, STORAGE AND USE OF THIS PRODUCT. SIPCAM AGRO USA, INC. DOES NOT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE ANY OTHER WARRANTY, GUARANTEE OR REPRESENTATION CONCERNING THIS PRODUCT.**

# Echo® ZN Agricultural Fungicide

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

Date of issue: 05/26/2015

Version: 1.0

### SECTION 1: IDENTIFICATION

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Echo® ZN Agricultural Fungicide

**Synonyms:** Tetrachloroisophthalonitrile, Chlorothalonil

**Other means of identification:** EPA Reg. No. 60063-4

#### 1.2. Intended Use of the Product

**Use of the substance/mixture:** Fungicide

#### 1.3. Name, Address, and Telephone of the Responsible Party

##### Manufacturer

Sipcam Agro USA, Inc.

2525 Meridian Parkway, Suite 350

Durham, NC 27713

T 919-226-1195

#### 1.4. Emergency Telephone Number

**Emergency Number** : (800) 424-9300 CHEMTREC (transportation and spills) (800) 900-4044 Poison Control Center (human health) (800) 345-4735 ASPCA (animal health)

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

##### Classification (GHS-US)

Acute Tox. 2 (Inhalation:dust,mist) H330

Eye Irrit. 2B H320

Carc. 2 H351

Aquatic Acute 1 H400

Aquatic Chronic 2 H411

Full text of H-phrases: see section 16

#### 2.2. Label Elements

##### GHS-US Labeling

##### Hazard Pictograms (GHS-US)



##### Signal Word (GHS-US)

: Danger

##### Hazard Statements (GHS-US)

: H320 - Causes eye irritation.

H330 - Fatal if inhaled.

H351 - Suspected of causing cancer.

H400 - Very toxic to aquatic life.

H411 - Toxic to aquatic life with long lasting effects.

##### Precautionary Statements (GHS-US)

: P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P260 - Do not breathe dust/fume/gas/mist/vapors/spray.

P264 - Wash ... thoroughly after handling.

P271 - Use only outdoors or in a well-ventilated area.

P273 - Avoid release to the environment.

P280 - Wear eye protection, protective gloves.

P284 - [In case of inadequate ventilation] wear respiratory protection.

P304+P340 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.

# Echo® ZN Agricultural Fungicide

## Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308+P313 - If exposed or concerned: Get medical advice/attention.  
P310 - Immediately call a poison center/doctor  
P320 - Specific treatment is urgent (see Section 4 on this label).  
P337+P313 - If eye irritation persists: Get medical advice/attention.  
P391 - Collect spillage.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P405 - Store locked up.  
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

### 2.3. Other Hazards

No additional information available

### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Chlorothalonil	(CAS No) 1897-45-6	38.5	Acute Tox. 1 (Inhalation:dust,mist), H330 Eye Irrit. 2B, H320 Carc. 2, H351 Aquatic Acute 1, H400
Zinc oxide	(CAS No) 1314-13-2	<10	Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Propylene glycol	(CAS No.) 57-55-6	≤5	Not Classified

Full text of H-phrases: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** May cause cancer. Fatal if inhaled. Causes eye irritation. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

**Symptoms/Injuries After Inhalation:** Inhalation of vapors may cause respiratory irritation.

**Symptoms/Injuries After Skin Contact:** May cause skin irritation.

**Symptoms/Injuries After Eye Contact:** Causes eye irritation.

**Symptoms/Injuries After Ingestion:** May be harmful if swallowed.

**Chronic Symptoms:** May cause cancer.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If medical advice is needed, have product container or label at hand.

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Alcohol foam, carbon dioxide, dry chemical, water spray, fog. Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. A heavy water stream may spread burning liquid.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not considered flammable but may burn at high temperatures.

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

## 5.3. Advice for Firefighters

**Firefighting Instructions:** Exercise caution when fighting any chemical fire.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other Information:** Do not allow run-off from fire fighting to enter drains or water courses. De-contaminate equipment or materials involved in pesticide fires.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Handle in accordance with good industrial hygiene and safety practice.

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel. Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection. Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain and collect as any solid.

**Methods for Cleaning Up:** Collect spillage. Clear up spills immediately and dispose of waste safely.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Do not eat, drink or smoke when using this product.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

**Storage Area:** Store locked up.

### 7.3. Specific End Use(s) Fungicide

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Zinc oxide (1314-13-2)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (respirable fraction)
USA ACGIH	ACGIH STEL (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (dust and fume)
USA NIOSH	NIOSH REL (STEL) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (fume)
USA NIOSH	NIOSH REL (ceiling) (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup> (dust)
USA IDLH	US IDLH (mg/m <sup>3</sup> )	500 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (fume) 15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable fraction)
Propylene glycol (57-55-6)		
AIHA	AIHA TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>

### 8.2. Exposure Controls

#### Appropriate Engineering Controls

: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Personal Protective Equipment** : Protective goggles. Gloves. Dust/aerosol mask.



**Hand Protection** : Wear chemically resistant protective gloves.

**Eye Protection** : Chemical goggles or safety glasses.

**Respiratory Protection** : If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

**Other Information** : When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Medium beige
Odor	: Slight
Odor Threshold	: No data available
pH	: 6.31
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: No data available
Auto-ignition Temperature	: Not applicable
Decomposition Temperature	: No data available
Flammability (solid, gas)	: Not applicable
Vapor Pressure	: $5.72 \times 10^{-7}$ torr @ 25°C
Relative Vapor Density at 20 °C	: 1.1929 g/ml @ 20 °C
Relative Density	: No data available
Solubility	: Water: 0.6 - 0.9 %
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: 738.1 cSt @ 25°C
	: No apparent reaction was observed between the test substance and water, hexane, zinc metal, mono-ammonium phosphate and potassium permanganate.

### 9.2. Other Information

VOC content : 56 %

## SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Product is stable.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures.
- 10.5. Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6. Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity:** Inhalation:dust,mist: Fatal if inhaled.

Echo® ZN Agricultural Fungicide	
ATE (Dust/Mist)	0.13 mg/l/4h
Chlorothalonil (1897-45-6)	
LD50 Oral Rat	3500 - 4800 mg/kg
LD50 Dermal Rat	2020 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

LC50 Inhalation Rat	2.52 - 13 mg/l/4h
ATE (Vapors)	2.52 mg/l/4h
ATE (Dust/Mist)	0.05 mg/l/4h
<b>Zinc oxide (1314-13-2)</b>	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rat	> 2000 mg/kg
<b>Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20 g/kg
LD50 Dermal Rabbit	20800 mg/kg

**Skin Corrosion/Irritation:** Not classified

pH: 6.31

**Serious Eye Damage/Irritation:** Causes eye irritation.

pH: 6.31

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Suspected of causing cancer.

<b>Chlorothalonil (1897-45-6)</b>	
IARC group	2B
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity.

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** inhalation of vapors may cause respiratory irritation.

**Symptoms/Injuries After Skin Contact:** May cause skin irritation.

**Symptoms/Injuries After Eye Contact:** Causes eye irritation.

**Symptoms/Injuries After Ingestion:** May be harmful if swallowed.

**Chronic Symptoms:** May cause cancer.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

**Ecology - General** : Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

<b>Chlorothalonil (1897-45-6)</b>	
LC50 Fish 1	0.012 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [semi-static])
EC50 Daphnia 1	0.0342 - 0.143 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	0.0076 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
<b>Zinc oxide (1314-13-2)</b>	
LC50 Fish 1	780 µg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.122 mg/l
NOEC chronic fish	0.026 mg/l (Species: Jordanella floridae)
<b>Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
LC 50 Fish 2	41 - 47 ml/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

### 12.2. Persistence and Degradability

<b>Echo® ZN Agricultural Fungicide</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Echo® ZN Agricultural Fungicide</b>	
Bioaccumulative Potential	Not established.
<b>Chlorothalonil (1897-45-6)</b>	
Log Pow	2.9 (at 22 °C)

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Propylene glycol (57-55-6)</b>	
<b>BCF fish 1</b>	< 1
<b>Log Pow</b>	-0.92

**12.4. Mobility in Soil** No additional information available

**12.5. Other Adverse Effects**

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

**13.1. Waste treatment methods**

**Waste Treatment Methods:** Waste portions of this product and contaminated absorbent materials may be disposed of by incineration provided the following conditions are observed:

Incinerate in a suitable oven fed by a mixture of air and methane, at 1100-1200°C; The HCl which may form in the incinerator exhaust gas must be conveyed into an aqueous absorption system containing 18-20% of Ca(OH)<sub>2</sub>.

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

**Ecology – Waste Materials:** Hazardous waste due to toxicity.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. In Accordance with DOT**

Ground Transport - NAFTA Non-Bulk: Not regulated Tank Truck

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Chlorothalonil), Marine Pollutant

Hazard Class or Division: Class 9

Identification Number: UN 3082

Packing Group: PG III

Comments:

Non-Bulk-Not Regulated (DOT defined as container capacities less than or equal to 119 gallons)

**14.2. In Accordance with IMDG**

Water Transport -International

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Chlorothalonil), Marine Pollutant

Hazard Class or Division: Class 9

Identification Number: UN 3082

Packing Group: PG III

**14.3. In Accordance with IATA**

Air Transport

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Chlorothalonil)

Hazard Class or Division: Class 9

Identification Number: UN 3082

Packing Group: PG III

## SECTION 15: REGULATORY INFORMATION

**15.1 US Federal Regulations**

<b>Echo® ZN Agricultural Fungicide</b>	
<b>SARA Section 311/312 Hazard Classes</b>	Immediate (acute) health hazard Delayed (chronic) health hazard
<b>EPA FIFRA Pesticide Product Notice</b>	This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.
<b>EPA FIFRA Signal Word</b>	Warning
<b>EPA FIFRA Hazard Statements</b>	May be fatal if inhaled. Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Do not breathe spray mist. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.
<b>EPA FIFRA Precautionary Statements</b>	Do not breathe spray mist.

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Chlorothalonil (1897-45-6)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on United States SARA Section 313	
<b>SARA Section 313 - Emission Reporting</b>	0.1 %
<b>Zinc oxide (1314-13-2)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Propylene glycol (57-55-6)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>EPA TSCA Regulatory Flag</b>	Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

## 15.2 US State Regulations

<b>Chlorothalonil (1897-45-6)</b>	
<b>U.S. - California - Proposition 65 - Carcinogens List</b>	WARNING: This product contains chemicals known to the State of California to cause cancer.
<b>Chlorothalonil (1897-45-6)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List	
U.S. - Pennsylvania - RTK (Right to Know) List	
<b>Zinc oxide (1314-13-2)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List	
U.S. - Pennsylvania - RTK (Right to Know) List	
<b>Propylene glycol (57-55-6)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

## SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

<b>Revision Date</b>	: 05/26/2015
<b>Other Information</b>	: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

### GHS Full Text Phrases:

Acute Tox. 1 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 1
Acute Tox. 2 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Carc. 2	Carcinogenicity Category 2
Comb. Dust	Combustible Dust
Eye Irrit. 2B	Serious eye damage/eye irritation Category 2B
	May form combustible dust concentrations in air
H320	Causes eye irritation
H330	Fatal if inhaled
H351	Suspected of causing cancer
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects

# Echo® ZN Agricultural Fungicide

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

H412	Harmful to aquatic life with long lasting effects
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*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

SDS US (GHS HazCom)