

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PM 32

5785-70

5-13-98

10/23

J. Michael Kelley  
 Director, Regulatory Affairs  
 Great Lakes Chemical Corporation  
 P. O. Box 2200  
 West Lafayette, IN 47906

MAY 13 1998

Dear Mr. Kelley:

**Subject:** Agribrom® Tablets (EPA Reg. No. 5785-69)  
 Agribrom® Granules (EPA Reg. No. 5785-70)  
 Confidential Statement of Formula and Label Amendment  
 Correspondence Dated March 13, 1998

Your amendment request to change the Manufacturing Use Product used to reformulate your products and to change the percent active ingredient on the labels to 96% is acceptable pending the following changes.

- The acceptable chemical name for the active ingredient is 1-bromo-3-chloro-5,5-dimethylhydantoin. Please use this form of the name on both the Confidential Statements of Formula (CSF) and on the labels.
- On the labels in the ingredients statement, change "Other Ingredients" to "Inert Ingredients".
- Please submit three copies of the final corrected labels to the Agency.

Stamped copies of the labels are enclosed for your records. Should you have any questions or concerns, please call Kathryn Scanlon on (703) 308-6418.

Sincerely Yours,



Robert S. Brennis  
 Product Manager 32  
 Regulatory Management Branch II  
 Antimicrobial Division (7504C)

7510W:K.Scanlon:ks:05/12/98:AGRI6970.LTR

CONCURRENCES

CONCURRENCES								
SYMBOL ▶	7510W							
SURNAME ▶	K. Scanlon							
DATE ▶	May 12, 1998							

20/23

# AGRIBROM® GRANULES

For the control of algal and microbial slimes in irrigation systems, recirculating cooling water systems, and surfaces in greenhouses and nurseries for production of ornamentals.  
Not for use on food or food crops.

**ACTIVE INGREDIENT:**

1-Bromo-3-chloro-5,5-dimethyl-2,4-imidazolidinedione..... 96.0%

**OTHER INGREDIENTS:**..... 4.0%

**TOTAL** ..... 100%

**KEEP OUT OF REACH OF CHILDREN**

**DANGER**

**PELIGRO**

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.)

**STATEMENT OF PRACTICAL TREATMENT:**

**IF SWALLOWED:** Seek medical attention promptly. Do not induce vomiting. Do not drink alcohol. Drink at least 8 ounces of water (not to exceed 0.23 oz. per pound in a child.)

**SKIN CONTACT:** Remove contaminated clothing immediately. Brush off excess chemical and wash skin with large volumes of soap and water, flushing the skin with water for at least 15 minutes. If skin irritation develops, seek medical attention.

**EYE CONTACT:** Irrigate eyes with large volumes of room temperature water for at least 15 minutes, then seek medical attention promptly.

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.

**SEE ADDITIONAL PRECAUTIONARY STATEMENTS ON SIDE PANEL**

ACCEPTED  
with COMMENTS  
in EPA Letter Dated:

MAY 13 1998

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act as  
amended, for the pesticide,  
registered under EPA Reg. No. 5785-70

NET WEIGHT: \_\_\_\_\_

LOT NO.: \_\_\_\_\_

AGBROMG-1 REV.MI-70-H

GREAT LAKES CHEMICAL CORPORATION

P.O. BOX 2200

WEST LAFAYETTE, IN 47996-2200 U.S.A.

EPA REG. NO. 5785-70

EPA EST. NO. 5185-MI-01

**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**DANGER**

**CORROSIVE.** The solid concentrate causes eye and skin damage. May be fatal if swallowed. Do not get in eyes, on skin, or on clothing. Irritating to nose and throat. Avoid breathing dust. Wash thoroughly with soap and water after handling.

Diluted application solutions are not irritating to the eyes or skin.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Applicators and handlers must wear:

Coveralls over long-sleeved shirt and long pants.

Waterproof gloves.

Chemical-resistant footwear plus socks.

Protective eyewear.

Chemical-resistant headgear for overhead exposure.

Chemical-resistant apron when cleaning equipment, mixing or loading.

Mixer and loaders must wear:

Above applicator and handlers personal protective equipment.

**AND**

Dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C).

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

**User Safety Recommendations:**

Users should:

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

**ENVIRONMENTAL HAZARDS**

This product is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge

effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**PHYSICAL AND CHEMICAL HAZARDS**

Strong oxidizing agent. Mix only with water. Use clean, dry utensils and equipment. Do not add this product to any dispensing device containing remnants of any other product. Such use may cause a violent reaction leading to fire and explosion. Contamination with moisture, organic matter or other chemicals may start a chemical reaction with generation of heat, hazardous gases and possible fire and explosion. In case of contamination or decomposition, do not reseal container. If possible, isolate container in open air or well ventilated area. If necessary flood with large volumes of water.

**DIRECTIONS FOR USE**

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

For the control of algal and microbial slimes in irrigation systems, recirculating cooling water systems, and surfaces in greenhouses and nurseries for production of ornamentals. Not for use on food or food crops.

Agribrom is intended for use on all ornamentals. Please refer to supplemental labeling entitled Agribrom, Agribrom Granules and Agribrom Tablets Supplemental Labeling (AGBRM-3) accompanying this packaging for a brief list of ornamental examples.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**STORAGE AND DISPOSAL**

**STORAGE:** Keep product dry in tightly closed container when not in use. Store in a cool, dry, well ventilated area away from heat, open flames, organic chemicals and sunlight. Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

**DISPOSAL:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. **DO NOT REUSE EMPTY CONTAINER.** Triple rinse the container (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incinerate. Burn only if allowed by state or local authorities. If burned, stay out of smoke.

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

**CHEMIGATION:** Refer to supplemental labeling entitled Agribrom, Agribrom Granules and Agribrom Tablets Supplemental Labeling (AGBRM-3) accompanying this packaging for use directions for chemigation, posting requirements of chemigation areas, product use when connected to public water systems, and use in automatic water distribution systems including: drip (trickle) irrigation systems, mist, fog, capillary mat, spaghetti tubes, ebb-and-flow, hydroponics. Do not apply this product through any irrigation system unless the supplemental labeling on chemigation is followed.

**RECIRCULATING COOLING WATER SYSTEMS.** For the control of algal and microbial slimes in recirculating cooling water systems in greenhouses and nurseries.

For best results, evaporative cooling equipment should be clean and free from algae and microbial slimes at the beginning of treatment. Equipment should be adjusted for even distribution of treated water over the surface of the evaporative cooling pad.

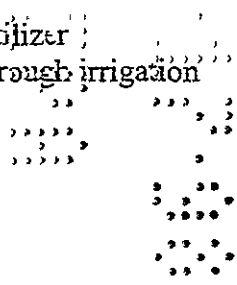
**DOSAGE RATES. Initial Dose.** When the system is noticeably fouled, use 1 ounce of Agribrom Granules per 100 gallons of water contained in the system. Add additional Agribrom Granules until a residual of 10 to 35 ppm bromine is established. Maintain treatment until system is free from microbial fouling. **Maintenance Dose.** Use Agribrom Granules as needed to maintain a residual of 5 to 15 ppm bromine.

**IRRIGATION AND AUTOMATIC WATER DISTRIBUTION SYSTEMS (INCLUDING MIST, FOG, AND SUB-IRRIGATION SYSTEMS). FOR ORNAMENTAL USE ONLY. NOT FOR USE ON FOOD OR FOOD CROPS.** For the control of algal and microbial slimes in irrigation systems and surfaces in greenhouses and nurseries for production of ornamentals.

**DOSAGE RATES.** For best results, irrigation equipment should be clean and free from microbial fouling at the beginning of treatment. Use Agribrom Granules to maintain a residual of 5 to 15 ppm bromine in the treated water. To insure even distribution of Agribrom Granules, it is important to level treated mats. If microbial growth develops, add additional Agribrom Granules until bromine residual reaches 10 to 35 ppm. Continue treatment until fouling is eliminated, then resume treatment between 5 and 15 ppm bromine.

**MEASUREMENT OF BROMINE RESIDUALS.** Treatment levels of Agribrom Granules can best be measured with an Agribrom test kit. Bromine residuals should be measured in water taken from the treated systems while it is running. Tests should be made immediately after drawing water samples from the system.

**PRECAUTIONS.** Do not mix Agribrom Granules with pesticide or fertilizer concentrates. Do not apply Agribrom during application of pesticides through irrigation systems.



60703

Application of Agribrom Granules above labeled rates may result in phytotoxicity. If symptoms of phytotoxicity develop, check bromine residual and lower or discontinue treatment.

**AVAILABLE BROMINE: 60%**

**AVAILABLE CHLORINE: 26%**

NOTE: Seller warrants that this product complies with the specifications expressed in this label. Seller makes no other warranties; and disclaims all other warranties express or implied, including but not limited to warranties of merchantability and fitness for the intended purpose. Seller's liability for default, breach, or failure under this label shall be limited to the amount of purchase price. Seller shall have no liability for consequential damages.

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**Directions for use of the product(s)  
Agribrom<sup>®</sup>, Agribrom<sup>®</sup> Granules and Agribrom<sup>®</sup> Tablets**

**SUPPLEMENTAL LABELING**

EPA Registration Number(s)

5785-69

5785-70

**KEEP OUT OF REACH OF CHILDREN**

**DANGER**

**PELIGRO**

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(If you do not understand the label, find someone to explain it to you in detail.)

**READ THIS BOOKLET AND ENTIRE LABEL CAREFULLY PRIOR TO USE. USE THIS  
PRODUCT ONLY ACCORDING TO LABEL INSTRUCTIONS.**

**GREAT LAKES CHEMICAL CORPORATION  
P.O. BOX 2200  
WEST LAFAYETTE, INDIANA 47996-2200 U.S.A.**

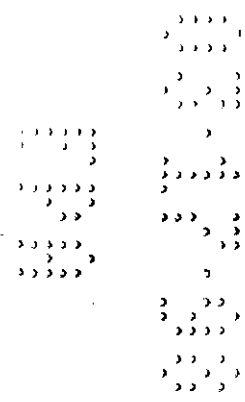
Registered trademark of Great Lakes Chemical Corporation.  
Copyright 1998 Great Lakes Chemical Corporation.

AGBRM-3 REV. GLK-260C

**ACCEPTED  
with COMMENTS  
in EPA Letter Dated:**

**MAY 13 1998**

**Under the Federal Insecticide,  
Fungicide, and Rodenticide Act as  
amended, for the pesticide,  
registered under EPA Reg. No. 5785-70**



## STATEMENT OF WARRANTY AND LIABILITY

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## STATEMENT OF PRACTICAL TREATMENT

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**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.

## PRECAUTIONARY STATEMENTS

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**DANGER. CORROSIVE.** The solid concentrate causes eye and skin damage. Harmful or fatal if swallowed. Do not get in eyes, on skin, or on clothing. Irritating to nose and throat. Avoid breathing dust. Wash thoroughly with soap and water after handling.

Diluted application solutions are not irritating to the eyes and skin.

### PERSONAL PROTECTIVE EQUIPMENT

- Applicators and handlers must wear:
- Coveralls over long-sleeved shirt and long pants.
- Waterproof gloves.
- Chemical-resistant footwear plus socks.
- Protective eyewear.
- Chemical-resistant headgear for overhead exposure.
- Chemical resistant apron when cleaning equipment, mixing or loading.

Mixer and loaders must wear a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C) in addition to the above personal protective equipment.

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



**User Safety Recommendations:**

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
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### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forest, nurseries, and green houses, 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), notification to workers, and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

A restricted entry interval is not applicable due to the nature of application concentrations. However it is recommended that worker entry into treated areas not be allowed until sprays have dried or dusts have settled.

Notify workers of the application by warning them orally and by posting warning signs at entrances to treated areas.

#### I. RESTRICTIONS FOR CHEMIGATION

##### A. GENERAL CHEMIGATION

Agribrom may be used continuously only in the following greenhouse and nursery irrigation systems: drip (trickle) irrigation including spaghetti tubes; sprinkler systems including mist and fog overhead sprinklers; and flood (basin) systems including ebb and flow systems (closed recirculating irrigation systems), hydroponics and capillary mat systems. Do not apply this product through any other type of irrigation system.

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

If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or Great Lakes Chemical Corporation, (765)-497-6204.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

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

**B. CHEMIGATION SYSTEMS CONNECTED TO PUBLIC WATER SYSTEMS**

Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

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

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**C. POSTING OF CHEMIGATION AREAS**

Posting of areas to be chemigated is required when 1) any part of a treated area is within 300 feet of sensitive areas such as residential areas, labor camps, businesses, day care centers, hospitals, in-patient clinics, nursing homes or any public areas such as schools, parks, playgrounds, or other public facilities not including public roads, or 2) when the chemigated area is open to the public such as golf courses or retail greenhouses.

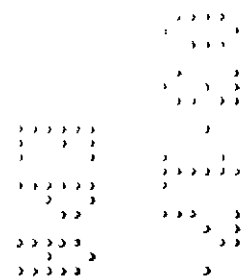
Posting must conform to the following requirements. Treated areas shall be posted with signs at all usual points of entry and along likely routes of approach from the listed sensitive areas. When there are no usual points of entry, signs must be posted in the corners of the treated areas and in any other location affording maximum visibility to sensitive areas. The printed side of the sign should face away from the treated area towards the sensitive area. The sign shall be printed in English. Signs must be posted prior to application and must remain posted until foliage has dried and soil surface water has disappeared. Signs may remain in place indefinitely as long as they are composed of materials to prevent deterioration and maintain legibility for the duration of the posting period.

**This sign is in addition to any sign posted to comply with the Worker Protection Standard.**

All words shall consist of letters at least 2 1/2 inches tall, and all letters and the symbol shall be a color which sharply contrasts with their immediate background.

At the top of the sign shall be the words KEEP OUT, followed by an octagonal stop sign symbol at least 8 inches in diameter containing the word STOP. Below the symbol shall be the words PESTICIDES IN IRRIGATION WATER. Below is a small-scale illustration of an acceptable sign.

**TEXT FOR POSTING:** Shall consist of letters at least 2 1/2 inches tall, all letters and the symbol shall be a color which sharply contrast with their immediate background.



**NOTE:** Octagon stop sign symbol shall be at least 8 inches in diameter, containing the word STOP

Posting required for chemigation does not replace other posting and reentry interval requirements for farmworker safety.

**II. SPINKLER AND DRIP (TRICKLE) CHEMIGATION**

Agribrom may be used continuously only in the following sprinkler and drip (trickle) irrigation systems: drip irrigation (trickle) including spaghetti tubes and overhead sprinklers including mist and fog sprinklers (greenhouses only).

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

System must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

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

**III. FLOOD (BASIN), FURROW AND BORDER CHEMIGATION**

Agribrom may be used continuously only in the following flood (basin) irrigation systems: ebb and flow systems (closed recirculating irrigation systems), hydroponics and capillary mat systems.

Systems using a gravity flow pesticide dispensing system must meter the pesticide into the water at the head of the planting area and downstream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential for water source contamination from backflow if water flow stops.

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

- a. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
- b. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- c. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- d. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- e. 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.
- f. System must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

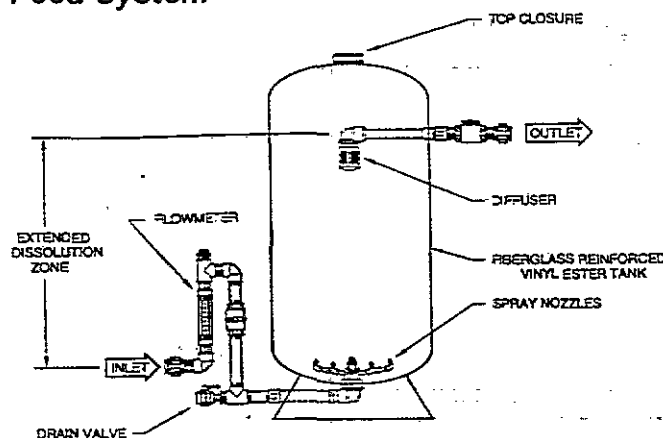
#### IV. METHODS OF APPLICATION

Agribrom Tablets and Granules must be applied using a brominator, injection system or a simple erosion system.

##### A. Brominators

Description: The brominator feed system (Figure 1) is a specialized bypass feeder designed to apply Agribrom Granules and Agribrom Tablets to water systems. Agribrom powder can not be used in brominators. Feed water flows through pressurized spray nozzles, creating turbulence and adequate mixing inside the Brominator tank. Agribrom is dispensed into the system by dissolution and erosion from the chemical bed.

Figure 1. *Brominator Feed System*



1. Sizing Guidelines

Step 1 - Consider Background Parameters

a. Agribrom demand - Systems using pond or other surface water may require a higher feed rate of Agribrom because the organic compounds in the water create a demand which must be overcome to allow the proper rate of Agribrom to be available for control of algae and slimes in the irrigation system and on the crop.

b. Flowmeter Range - Select a Brominator which operates near the middle of the flowmeter range to allow for seasonal variations or demand fluctuations.

c. Brominator Feed System Location - Allow room above the Brominator for adequate ventilation and easy refill. The height of all Brominators is shown in Figure 1. "Brominator System Profile".

d. Refill Frequency - To maintain accurate dispensing rate performance, refill brominators when they reach half the initial chemical bed level. Refill frequencies are calculated based on this criterion.

e. Proper sizing of a Brominator feed system is critical to achieve successful biofouling control with Agribrom. The sizing information presented herein is only an approximation. Each system is unique and proper sizing may vary according to season, system demand and feed frequency.

Step 2 - Determine the Daily Product Dispensing Requirements  
Non-recirculating water systems

a. Determine Daily Volume (DV) in Gallons:

Daily Volume (DV) = Gallons Per Minute (GPM) X 60 Minutes X hours per day of operation

b. Determine the Pounds of Agribrom Required (PR) in hours

$$PR \text{ (lbs/hr)} = \frac{DV \times (\text{ppm}) \times (1.2)}{1,000,000}$$

Step 3 - Select Appropriate Brominator Model

To select the proper model Brominator, compare the PR to the maximum dispensing rates for Agribrom Granules and Agribrom Tablets shown in Figure 2. Select a model that will dispense a maximum rate greater than the PR. More than one model may be appropriate. To decide between two models, use the dispensing curves for Agribrom Granules and Agribrom Tablets in Figure 3. Select a system that is equal to the PR near the middle of the flowmeter range (horizontal axis). When in doubt, select the larger model. Also consider the refill frequency (right-hand vertical axis) in your decision.

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Figure 2. Dispensing Rates<sup>1</sup>

Agribrom® Granules					
Brominator™ Model	Vessel Capacity (lbs)	Maximum Dispensing Rate (lbs/hr)			
		50°F	70°F	90°F	110°F
SC-10-02	50	0.6	1.0	1.4	1.9
SC-10-05	50	1.1	1.7	2.4	3.2
SC-10-10	50	1.9	3.0	4.3	5.6
SC-14-10	250	3.5	5.5	7.8	10.2
SC-14-20	250	9.0	13.0	16.0	20.0
SC-21-20	500	9.0	13.0	16.0	22.0
SC-21-100	500	28.0	46.0	60.0	74.0
SC-36-20	1500	9.0	15.0	21.0	28.0
SC-36-100	1500	36.0	57.0	78.0	89.0

Agribrom® Tablets					
Brominator™ Model	Vessel Capacity (lbs)	Maximum Dispensing Rate (lbs/hr)			
		50°F	70°F	90°F	110°F
SC-10-02	50	0.1	0.3	0.5	0.6
SC-10-05	50	0.3	0.5	0.9	1.2
SC-10-10	50	0.4	0.8	1.4	1.9
SC-14-10	250	1.0	1.7	3.1	4.2
SC-14-20	250	1.5	2.8	5.0	6.7
SC-21-20	500	2.0	4.0	8.0	11.0
SC-21-100	500	5.0	10.0	18.0	28.0
SC-36-20	1500	4.0	7.5	14.0	20.0
SC-36-100	1500	8.0	17.0	29.0	49.0

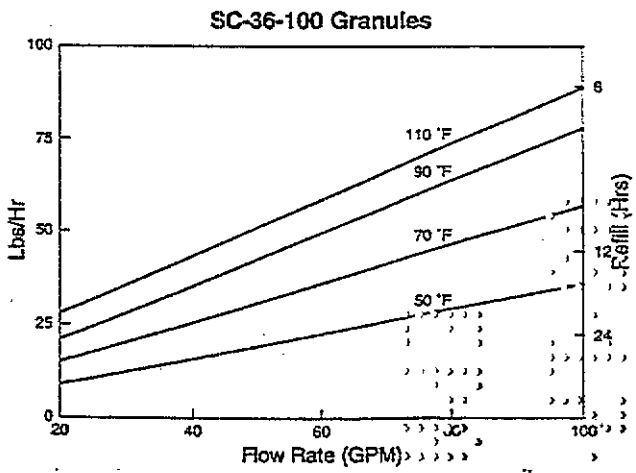
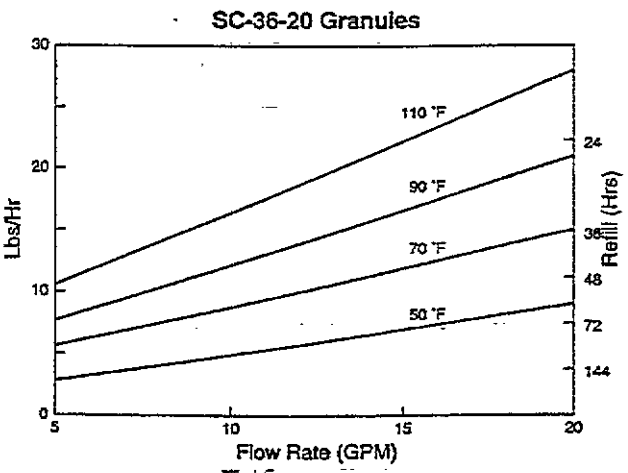
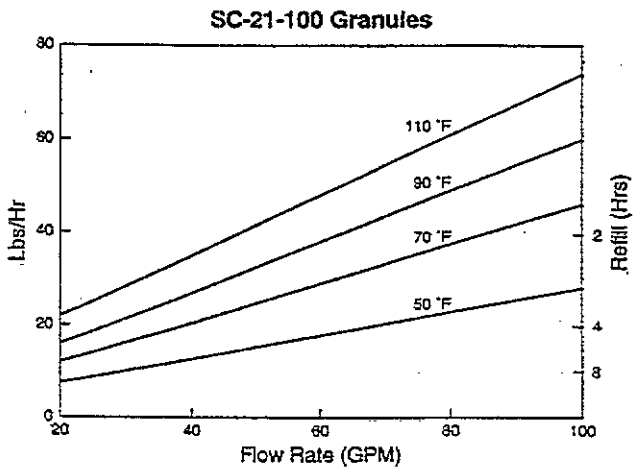
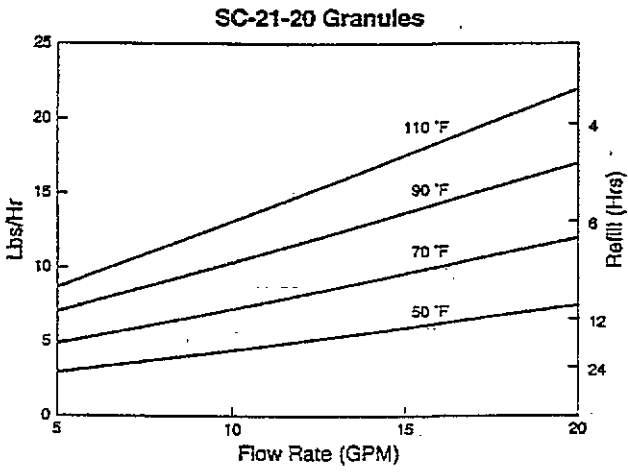
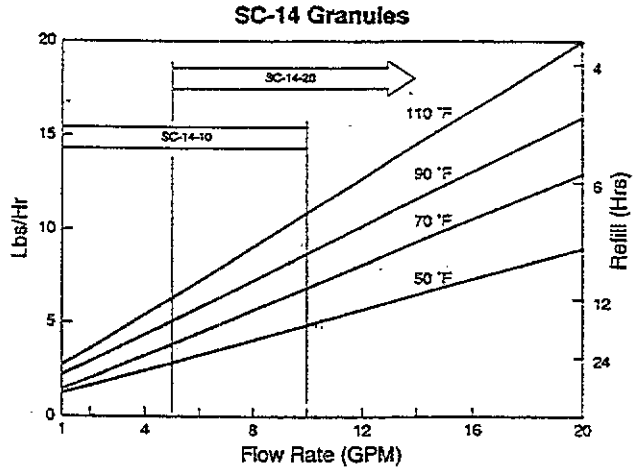
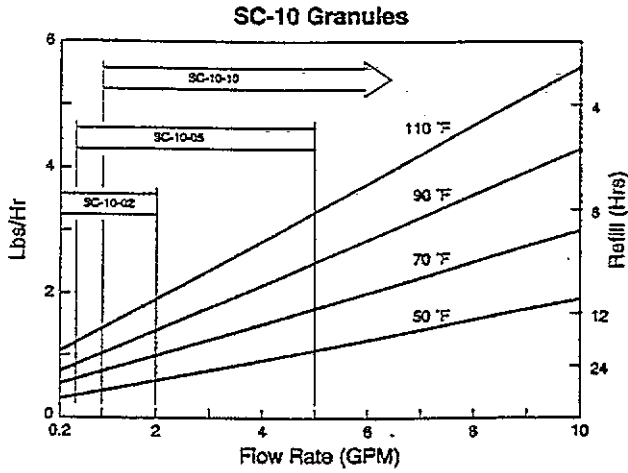
<sup>1</sup>This dispensing rate information has been derived under average conditions. Actual rates may be affected by system demand, condition of make-up water, or specific treatment objectives. Therefore, while this information is believed to be accurate, actual conditions may vary the dispensing rate. No warranty, express or implied is extended to the accuracy of this information.

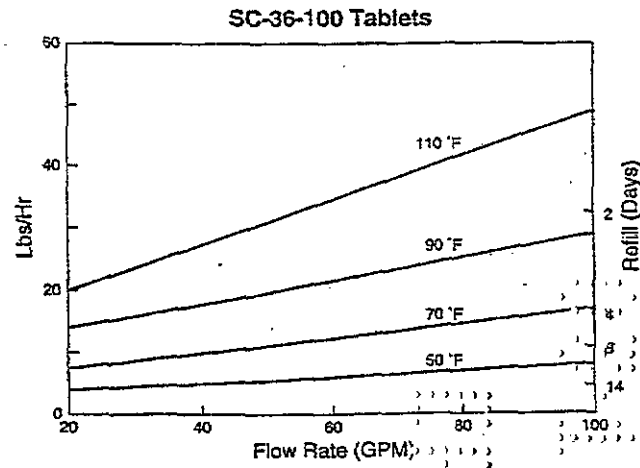
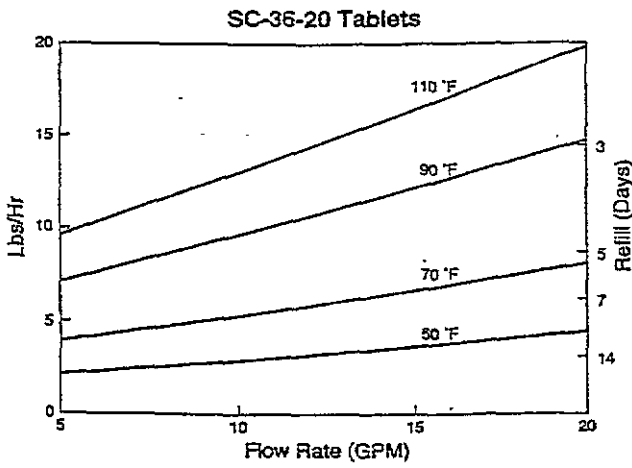
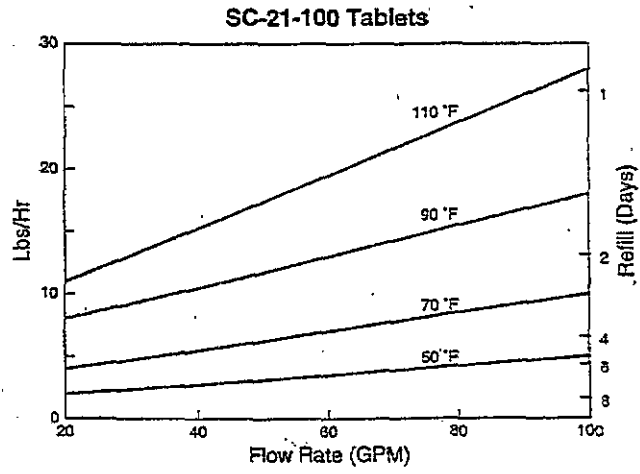
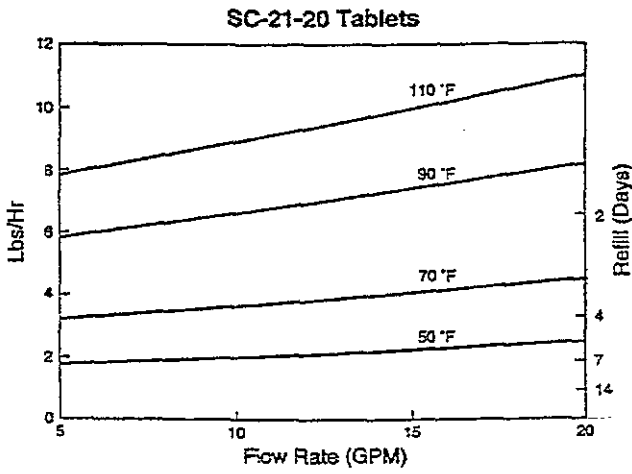
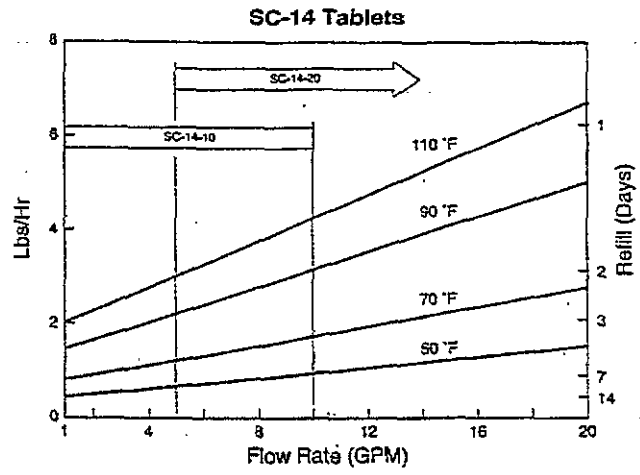
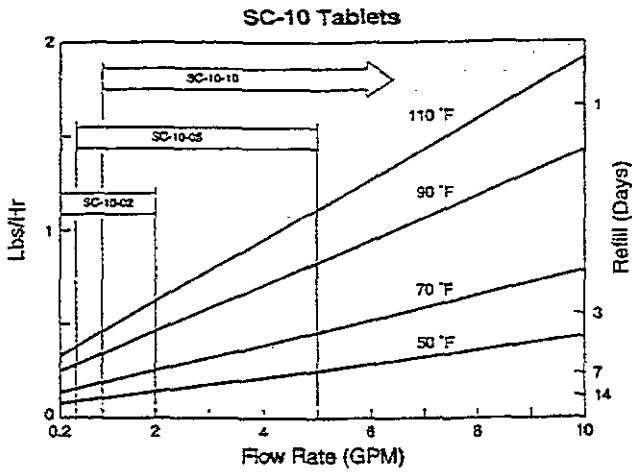
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Figure 3: Agribrom Dispensing Curves





## 2. Application instructions

Since each water system is unique, rates of Agribrom will vary from system to system. Factors such as water temperature variations and demand fluctuations may affect control.

### Start-up

- a. Vary the flow of water through the Brominator system to maintain the desired levels (ppm).
- b. During the start-up period, there may be a high initial demand until oxidizable organics and bacteria are cleaned out of the system. Agribrom consumption may be higher than calculated during the start-up period.
- c. Set the Brominator flowmeter to a rate (gallons per minute) which gives 5-35 ppm reading at the farthest water emitter from the Brominator. Use the Agribrom Test Kit to determine ppm.

## 3. Brominator Pressure and Temperature Ratings

When assembled, installed and operated according to instructions, all Brominator systems are rated to a maximum operating pressure of 100 psi at a temperature of 100° F. Systems can be operated at temperatures greater than 100° F, but at reduced maximum operating pressures as set forth in Figure 4.

Figure 4. *Pressure and Temperature Ratings*

°F	Maximum Operating Pressure (psi)
100	100
110	90
120	70
130	45

**NOTE:** External pressure relief valves and inlet regulator valves are recommended for applications where system pressure is unknown or could fluctuate in excess of the maximum pressure.

### B. Injector Systems

Agribrom may be used with most injector units. To use Agribrom with an injector, it is first necessary to make a concentrated solution of Agribrom. This solution can then be injected into the irrigation system.

1. Solubility of Agribrom

Agribrom is somewhat insoluble in water. The chart below (Figure 5) gives the maximum ppm attainable for various water temperatures. These numbers are for distilled water (demand free). Actual concentration will be lower.

It is necessary to agitate the solution for 15-20 minutes after adding the Agribrom in order to insure maximum concentrations (ppm). Agribrom does have a saturation point in water. This means that the water will only dissolve a given quantity of Agribrom. After that point is reached, further additions of the product will merely fall to the bottom of the mixing container. For instance, if you look at the solubility chart (Figure 5) at 50° F, one gallon of distilled water can dissolve 4.7 grams of Agribrom. Anything over 4.7 grams will not dissolve. These numbers were derived using demand free water. Therefore, under normal conditions, it will take slightly more grams per gallon than actually listed on the chart to reach saturation. Additionally, the concentrate solution will usually be slightly below the approximate level of free bromine in concentrate (ppm) column on the far right column of the chart (Figure 5).

2. Preparation of Concentrated Agribrom Solutions

- a. Determine number of gallons to be treated per day, total water consumption.
- b. Divide the number of gallons to be treated by the dilution ratio of your injector. This gives you the amount of Agribrom concentrate to prepare.
- c. Choose a rate of application (ppm Agribrom) between 5-35 ppm.
- d. Mix the Agribrom concentrated solution according to the chart (Figure 5). Agitate the solution until Agribrom is totally dissolved before applying through the injection system.
- e. Use only plastic measures and containers while preparing Agribrom.

NOTE: Agribrom concentrate must be used within 48 hours after mixing.

Figure 5. Agribrom Solubility in Demand-Free Water

Agribrom Solubility in Demand-Free Water					
Water Temperature °F (°C)	Grams Per Gallon	Grams Per 10 Liter	Ounces Per 10 Gallons	Level Tbs. Per 10 Gallons	Approximate Level of Free Residual Bromine in Concentrate (ppm)
50 (10)	4.7	12.4	1.7	3.9	1560
59 (15)	5.4	14.3	1.9	4.5	1740
68 (20)	6.2	16.4	2.2	5.3	1970
77 (25)	7.2	19.0	2.5	6.0	2360
86 (30)	8.3	21.9	2.9	6.9	2550
95 (35)	9.6	25.4	3.4	8.0	3170

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104 (40)	11.0	29.1	3.9	9.2	3590
113 (45)	12.7	33.5	4.5	10.6	4030
122 (50)	14.7	38.8	5.2	12.3	5080
131 (55)	17.0	44.9	6.0	14.2	5460
150 (60)	19.6	51.8	6.9	16.3	6420

\*Do not use water temperature over 140°F (60 °C) to prevent degradation of the active ingredient.

Note: All water sources normally used in production greenhouses and nurseries will have a "demand" of some degree. Demand is an expression of the reduction in active ingredient availability in Agribrom-treated water due to the presence of organic matter, soluble ferrous iron and/or sulfides. Therefore, in practice, concentrations shown above will not be obtained, but they do serve as a guide to achieving desired levels.

### C. Erosion Feeders for Cooling Pads

Agribrom can be used to clean up cooling pads. This type of application can be accomplished by using a simple erosion feeder and the following steps.

1. Hang a mesh bag or plastic container with a perforated bottom, under the return line (to the reservoir). This container should hold 3-5 lbs of Agribrom.
2. Using the Agribrom Test Kit, determine the ppm of Agribrom in the water (test water after it has gone through the pad). Maintain 5-15 ppm Agribrom in the water to maintain a clean system.
3. If the readings are too high, remove some tablets from the container and retest.

## V. USAGE AND DOSAGE RATES

A. IRRIGATION AND AUTOMATIC WATER DISTRIBUTION SYSTEMS. Including drip, sprinkler, mist, fog and subirrigation systems. For prevention of growth of algae and build-up of microbial slimes and fouling. **Not for use on food or food crops.**

**PRECAUTIONS: Do not mix Agribrom with pesticide or fertilizer concentrates. Do not apply Agribrom during application of pesticides through the irrigation system.**

1. **DOSAGE RATES.** For best results, irrigation equipment should be clean and free from microbial fouling at the beginning of treatment. To ensure even distribution of treated water on capillary mats make sure benches are level. Add Agribrom Tablets or Granules until bromine residual reaches 10-35 ppm. Continue treatment until fouling is eliminated then reduce dosage to maintain between 5 and 15 ppm.

2. Ebb and Flow Systems and Capillary Mat Systems

The maintenance rate of Agribrom in these systems should not exceed 15 ppm.

**B. RECIRCULATING COOLING WATER SYSTEMS.** For control of microbial slimes and fouling in recirculating evaporative cooling systems in greenhouses and agricultural premises. For best results, evaporative cooling equipment should be clean and free from algal and microbial slime at the beginning of treatment. Equipment should be adjusted for even distribution of treated water over the surface of the evaporative cooling pad.

**PRECAUTIONS:** Do not mix Agribrom with pesticide or fertilizer concentrates. Do not apply Agribrom during application of pesticides through the irrigation system.

1. **DOSAGE RATES. Initial dose.** When the system is noticeably fouled apply Agribrom Tablets or Granules to system until a residual of 10-35 ppm bromine is established. Maintain treatment until system is free of microbial fouling. **Maintenance dose:** Use Agribrom Tablets or Granules as needed to maintain a bromine residual of 5-15 ppm.

2. **TREATMENT OF WATER TO THE PADS.** Connect a brominator or similar type erosion feeder to the water line on the outlet side of the sump pump. Add Agribrom Tablets or Granules and adjust the rate of flow through the brominator to maintain 5-15 ppm bromine. For further information see Section IV METHODS OF APPLICATION.

3. **TREATMENT OF RETURN WATER.** Place Agribrom Tablets or Granules in a plastic mesh bag or plastic container with perforations in the bottom in the main stream of water entering the sump. Adjust the amount of Agribrom in the container to produce the bromine concentration required. Measure bromine residual, using an Agribrom test kit, in the water taken from the bottom of the evaporative cooling pad or at the point where the cooling water flows into the sump for recycling. For further information see Section IV METHODS OF APPLICATION.

For further information see Section IV METHODS OF APPLICATION.

**VI. ORNAMENTAL EXAMPLES**

Agribrom is intended for use on all ornamentals. The following list references only examples of ornamentals on which Agribrom may be used.

- |                          |                 |                    |
|--------------------------|-----------------|--------------------|
| Aglaonema spp.           | Ficus spp.      | Prayer plant       |
| Aluminum plant           | Gardenia        | Pyracantha         |
| Anthericum spp.          | Geranium        | Quercus spp. (oak) |
| Asparagus fern           | Gloxinia spp.   | Red maple          |
| Begonia                  | Golden pothos   | Rhododendron       |
| Boston fern              | Good-luck palm  | Rose periwinkle    |
| Bougainvillea spp.       | Gynura spp.     | Saintpaulia spp.   |
| Caladium                 | Hibiscus spp.   | Schefflera spp.    |
| Camellia                 | Impatiens       | Spathiphyllum spp. |
| Cherry laurel            | Ivy             | Spider plant       |
| Chinese elm              | Juniper         | Sprenger asparagus |
| Chinese holly            | Mountain laurel | Strobilanthes spp. |
| Chrysanthemum            | Myrtys spp.     | Succulents         |
| Cissus spp.              | Natal plum      | Sweet viburnum     |
| Citrus spp. (ornamental) | Neanthe vella   | Synbgonium spp.    |

Cleome spp.  
Coleus spp.  
Cordyline spp.  
Crape myrtle  
Cretan brake  
Dieffenbachia spp.  
Donkey's tail  
Dracaena spp.  
Easter lily  
Exacum spp.

Nephthytis  
Orchids  
Peperomia  
Petunia  
Philodendron  
Photinia  
Pinus spp.  
Poinsettia  
Ponytail  
Pothos

Bald cypress  
Trailing velvet plant  
Velvet plant  
Vinca spp.  
Watermelon plant (ornamental)  
Yucca spp.  
Zebra plant