



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Mr. Arthur F. Gohlke
Tennessee Chemical Company
3400 Peachtree Road NE., Suite 401
Atlanta, GA 30326

NOV 10 1987

Dear Mr. Gohlke:

Subject: Amendments - Revised Labeling for Copper Sulfate Pentahydrate
Products

Copper Sulfate Large Crystals
EPA Registration No. 1109-1
Copper Sulfate Powdered Instant Bluestone
EPA Registration No. 1109-7 ✓
Copper Sulfate Medium Crystals
EPA Registration No. 1109-19
Copper Sulfate Granular Crystals
EPA Registration No. 1109-20
Copper Sulfate Snow Crystals
EPA Registration No. 1109-21
Copper Sulfate Superfine Crystals
EPA Registration No. 1109-32
Mountain Brand Copper Sulfate Liquid
EPA Registration No. 10103-10
Your Submission Dated September 24, 1987 and Received by
EPA October 26, 1987

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable provided that you:

1. Make the changes below before releasing the products for shipment bearing amended labeling:

- a. For all products except 1109-7 and 10103-10, modify first aid for swallowing to read:

If Swallowed: Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol.

- b. Delete Endangered Species labeling per our letter of June 25, 1987. This labeling is deferred until further notice from the Agency.

c. Modify Environmental Hazards language as follows:

- For products 1109-1, -19, -20, -21, and -32 delete "If effluent of treated terrestrial . . . sites . . ." and precede the rest of that paragraph with the qualifier "For Manufacturing Uses."
- For product 10103-10, delete proposed statements and substitute the same language as product 1109-7.

d. For product 1109-7, add the Spanish signal word "PELIGRO" and the text "Precaucion al usuario . . ." to front panel. Note applicable language in PR Notice 87-1 for chemigation use.

e. Under "How to Apply," indicate approximate spray volume for aquatic sites to assist the user in preparing spray solutions.

f. For product 10103-10, modify the active ingredient declaration to read:

Copper expressed as metallic* 6%

*From copper sulfate pentahydrate

Adjust inert ingredient declaration to total 100%.

Under Hazards to Humans, add:

"Causes eye irritation. May cause skin sensitization in certain individuals. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse."

The contaminated clothing statement in the following paragraph should be deleted. In the reentry section, change "WARNING" to "CAUTION."

Under Storage and Disposal modify the Pesticide Disposal statement to read:

"Wastes resulting from use of this product must be disposed of according to applicable Federal, State, or local procedures."

- A stamped copy of each label is enclosed for your records.**

Richard F. Mountfort *Rfm*
Product Manager (23)
Fungicide-Herbicide Branch
Registration Division (TS-767C)

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pn723

1109-7

4-67

NET WEIGHT 50 LBS.

COPPER SULFATE

POWDERED

INSTANT BLUESTONE

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RECEIVED
with comments
NOV 10 1987
1109-7

Active Ingredient:

Copper sulfate (pentahydrate)* 99%

Inert Ingredients 1%

(*Metallic copper equivalent 25.2%)

FOR:

- Algae control in impounded waters, lakes, ponds, and reservoirs.
- Preparation of a Bordeaux spray to control certain plant diseases.
- Also for manufacturing, repackaging, formulating algaecides, fungicides, and other non-pesticidal use.
- Use as a trace mineral in mixing animal feeds in accordance with good manufacturing procedures as prescribed by FDA and added at levels consistent with good feeding practices.

Keep out of reach of children

Precision Dugano

PEUBRO / **DANGER**

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS.

DANGER—Causes severe eye and skin irritation. Harmful if absorbed through skin or inhaled. May cause skin sensitization reactions in certain individuals. Avoid contact with skin, eyes, or clothing. Avoid breathing dust. Protective clothing, including goggles, should be worn. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

STATEMENT OF PRACTICAL TREATMENT:

IF IN EYES, flush with plenty of water. Call a physician. IF ON SKIN, wash with plenty of soap and water. Get medical attention. IF SWALLOWED, drink promptly a large quantity of milk, egg white, gelatin solution, or if these are not available, large quantities of water. Avoid alcohol. Do not give anything by mouth to an unconscious person. Call a physician or Poison Control Center.

NOTE TO PHYSICIAN:

Probable mucosal damage may contraindicate the use of gastric lavage. Measure against circulatory shock, respiratory depression and convulsion may be needed.

SEE BACK PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

TENNESSEE CHEMICAL COMPANY

Copperhill, Tennessee 37317

ADDITIONAL PRECAUTIONARY STATEMENTS ENVIRONMENTAL HAZARD STATEMENTS ✓

END USES

This pesticide is toxic to fish and aquatic organisms. Do not apply directly to water except as directed under the specific instructions section. Drift and runoff from treated areas may be hazardous to fish and aquatic organisms in adjacent aquatic sites. Direct application of copper sulfate to water may cause a significant reduction in populations of aquatic invertebrates, plants and fish. Do not treat more than one-half of a lake or pond at one time in order to avoid a depletion of oxygen from decaying vegetation. Allow 1 to 2 weeks between treatment for oxygen levels to recover. Trout and other species of fish may be killed at application rates recommended on this label, especially in soft or acid waters. However, fish toxicity generally decreases when the hardness of the water increases. Do not contaminate water by cleaning of equipment or disposal of wastes. Consult your State Fish and Game Agency before applying this product to public waters. Permits may be required before treating such waters.

MANUFACTURING USES

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

ENDANGERED SPECIES RESTRICTIONS: It is a violation of Federal laws to use any pesticide in a manner that results in the death of an endangered species or adverse modification of their habitat.

The use of this product may pose a hazard to certain Federally designated species known to occur in specific areas within the following counties:

State (Bulletin No.)	Species	Counties Where Found
California (EPA/ES-85-13)	Solano Grass	Solano
Tennessee (EPA/ES-85-04)	Slackwater Darter	Lawrence, Wayne, Hancock
(EPA/ES-85-07)	Freshwater Mussels	Claiborne, Hawkins, Sullivan
Alabama (EPA/ES-85-05)	Slackwater Darter	Lauderdale, Limestone, Madison
Virginia (EPA/ES-85-06)	Freshwater Mussels	Grayson, Smyth, Scott, Washington, Lee

Before using this product in the above counties you must obtain the EPA Bulletin specific to your area. The Bulletin identifies areas within these counties where the use of these pesticides is prohibited, unless specified otherwise. The EPA Bulletin is available from your County Agricultural Extension Agent, the Endangered Species Specialist in your State Wildlife Agency Headquarters, or the appropriate Regional Office of the U. S. Fish and Wildlife Service. **THIS BULLETIN MUST BE REVIEWED PRIOR TO PESTICIDE USE.**

NOTE: If treated water is to be used as potable water, the residual copper content must not exceed 1 ppm (4 ppm copper sulfate pentahydrate).

DIRECTIONS FOR USE

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

RE-ENTRY STATEMENT

Do not enter treated areas without protective clothing until sprays have dried or dust settled.

Because certain states may require more restrictive re-entry intervals for various crops treated with this product, consult your State Department of Agriculture for further information.

When oral warnings must be given to workers who are expected to be in a treated area or in an area about to be treated with this product. The oral warning should be that workers shall not be in field during spraying and not return until sprays have dried on plants. If worker must be in field during this time, workers must wear goggles for eye protection and protective clothing including a hat or similar head covering, long sleeve shirt, long legged trousers, or a coverall type garment, all of closely woven fabric covering the body, arms and legs, shoes and socks. If accidentally exposed, if in eyes, flush eyes with plenty of water for at least 15 minutes. If on body remove by washing and wash clothes before reuse. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers. Written warnings must include the following information: DANGER. Area treated with copper sulfate or Bordeaux spray on (date of application). Do not enter without appropriate protective clothing until spray in treated area has dried on plants.

STORAGE AND DISPOSAL ✓

STORAGE: Store product in a secure dry place and keep product dry. When opening, closing or handling open packages, or pouring product, wear goggles to prevent dusting into eyes. Spilled product should be swept up, used if clear, or disposed of according to instructions below.

Store product only in original container. During storage store pesticides separately to prevent cross contamination of other pesticides, fertilizers, food and feed.

DISPOSAL: Do not contaminate water, food, or feed by storage or disposal. Do not reuse this container. Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide spray mixtures, or rinseate 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.

When used for agricultural purposes consult State Agricultural Experiment Station or State Extension Service Specialists. Seller's guarantee shall be limited to the terms of the label and subject thereto the buyer assumes any risk to persons or property arising out of use or handling and accepts the product on these conditions.

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General Instructions For Use

Copper sulfate effectively controls many species of both filamentous (mat forming green) and planktonic (single cell blue-green) algae. The dose of copper sulfate and control are affected by algae species, water hardness, water temperature, and concentration as well as whether water is clear, turbid, flowing, or static. Preferably water should be clear and above 60° F with treatment made in late morning on a sunny day. Static water usually requires less copper sulfate than flowing water. The harder the water or the greater the algae concentration, the higher the required dose of copper sulfate. If floating mats of green algae are present, it is advisable to especially treat the surface of these mats for best control. Algae will absorb the copper sulfate within hours after treatment, and death should be evident within 3 to 5 days. If there is some doubt about the concentration to apply, it is generally preferable to begin with a lower dose and increase the dose until algae are killed. (A few algae species are resistant to copper sulfate and may not be killed.) Repeat treatments within a season may be needed to keep algae under control to the desired level.

NOTE: Note the above fish toxicity precautionary statement under Environmental Hazards. Treatment of algae can also result in oxygen loss from the water caused by the decay of dead algae. This loss can cause fish suffocation. To minimize this hazard, treat 1/3 to 1/2 of the water area in a single operation and wait 10 to 14 days between treatments. Begin treatments along the shore and proceed outwards in bands to allow fish to move into untreated water.

When a water solution of copper sulfate is prepared, preferably mix in a plastic or glass container. When using a metal container, use one that is painted, enameled, or copper lined. Copper sulfate solutions will slowly react or corrode galvanized containers and brass parts.

Specific Directions For Use

1. To control algae in impounded waters, lakes, ponds, and reservoirs:

When to Apply: Early treatment is essential for most satisfactory algae control at the lowest dosage levels. Early growth is usually confined to shallower shore areas. Begin treatment when not over 5 to 10% of the water surface area is covered with algae growths which is usually nearest the shoreline. Delaying treatment until heavy algae growths are present usually requires a higher dose and may result in fish distress or death since rapid decomposition of heavy growths greatly reduces the oxygen content of the water. Several repeat treatments are usually necessary to control algae each season.

Dosage Rates to Control Algae: Accurately determine the surface acres of water to be treated at one time and multiply this by the average depth in feet of this water area to determine the acre foot of water to be treated. One acre foot = one surface acre (43,560 sq. ft.) X one foot of depth. Each acre foot of water contains 326,000 gallons, or 2,720,000 pounds of water. If the problem algae genera is known, use the table below and its equivalence to determine the approximate dosage of this product needed to control that genera. (A dose of 1 ppm equals 1 pound of this product for each million pounds of water.) If the genera of either filamentous or planktonic algae is not known, apply 0.8 to 1.75 pounds of this product per acre foot of water, using the lower rate in soft water and the higher rate in hard water. For control of bottom-attached algae Chara and Nitella use 1.75 to 2.3 pounds per acre foot of water to be treated. If control is not achieved or in very adverse waters, a higher rate may be needed, but consider the fish caution. Dose should not exceed 4 ppm of this product (1 ppm of copper as metallic) when water is used for drinking.

COPPER SULFATE REQUIRED FOR TREATMENT OF DIFFERENT GENERA OF ALGAE

The genera of algae listed below are commonly found in waters of the United States. Use the lower recommended rate in soft waters (less than 50 ppm methyl orange alkalinity) and the higher concentration in hard water (above 50 ppm alkalinity). Always consult State Fish and Game Agency before applying this product to public waters.

ORGANISM	1/4 to 1/2 ppm*	1/2 to 1 ppm*	1 to 1-1/2 ppm*	1-1/2 to 2 ppm*
Cyanophyceae (Blue-green)	Anabaena Anacystis Aphanizomenon Gloeotrichia Gomphosphaeria Polycystis Rivularia	Cylindrospermum Oscillatoria Plectonema	Nostoc Phormidium	Calothrix Symploca
Chlorophyceae (Green)	Closterium Hydrodictyon Spirogyra Ulothrix	Botryococcus Cladophora Coelastrum Draparnaldia Enteromorpha Glossocystis Microspora Tribonema Zygnema	Chlorella Crucigema Desmidioidium Golenkinis Oocystis Palmella Pithophora Staurostrum Tetraedron	Ankistrodesmus Chara Nitella Scenedesmus
Diatomaceae (Diatoms)	Asterionella Fragilaria Melosira Navicula	Gomphonema Nitzschia Stephanodiscus Synedra Tabellaria	Achnanthes Cymbella Neidium	
Protozoae (Flagellates)	Dinobryon Souria Uroglena Volvox	Ceratium Cryptomonas Euglena Glenodinium Mallomonas	Chlamydomonas Hawmatococcus Peridinium	Eudorina Pseudonana

*1/4 to 1/2 ppm = .67 - 1.3 lbs/acre ft.

*1/2 to 1 ppm = 1.3 - 2.6 lbs/acre ft.

*1 to 1-1/2 ppm = 2.6 - 3.9 lbs/acre ft.

*1-1/2 to 2 ppm = 3.9 - 5.32 lbs/acre ft.

How to Apply: Copper sulfate can be applied to impounded waters by several methods to control algae. Powdered Instant Bluestone is most satisfactorily applied by preparing a solution or suspension in water and spraying this over the water body to be treated. When preparing a copper sulfate solution or suspension, particularly observe previous cautions describing the effect of copper sulfate solution on different metal used in sprayers and mixing containers.

2. Bordeaux spray preparation to control certain plant diseases:

Understanding a Bordeaux formulation: As an example, if a Bordeaux spray recommendation reads 10-10-100, the first figure means the number of pounds of copper sulfate pentahydrate; the second figure means the pounds of hydrated spray grade lime, Ca(OH)₂; and the third figure is the gallons of water into which both ingredients are mixed when a dilute ground sprayer is used for application. For concentrated sprayers, decrease the amount of water and dosage in accord with recommendations of your Extension Service and/or sprayer manufacturer. Various Bordeaux formulations including 8-8-100, 5-5-100, and 2-6-100 are commonly used on various crops.

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To formulate a Bordeaux spray: For a 10-10-100 mix 10 lbs of this Powdered Instant Bluestone in the spray water, then add the pounds of spray grade hydrated lime and remaining water given in the next section on Mixing a Bordeaux spray. For a 3-2-6-100 Bordeaux spray mix 3 lbs of zinc sulfate (36% zinc), 2 lbs of Powdered Instant Bluestone, and 6 lbs. of spray grade hydrated lime, into 100 gallons of water for conventional dilute spray.

Mixing a Bordeaux spray: Fill spray tank 1/2 full with water. Then, with agitation running, add Powdered Instant Bluestone copper sulfate by washing it through a brass, stainless steel, or plastic screen until all the copper sulfate is dissolved (and also the zinc sulfate when required). Then add the hydrated lime by washing it through this screen and finish filling tank with water. Continue agitate until all spray has been applied.

Choosing a Formulation For Use: The following Bordeaux formulas are examples of formulas that are known used on these crops for disease control. However in some areas due to local situations and use experience other formulations proven to be useful locally may be substituted. Consult and follow recommendations of your local State Agricultural Experiment Station or Extension Service.

<u>Crop</u>	<u>To Control</u>	<u>Directions</u>
Almonds, Apricots, Peaches, Nectarines	Coryneum blight (Shot hole)	Prepare a 10-10-100 Bordeaux and apply as a dormant spray in late fall and early spring before buds begin to swell.
Peaches	Leaf curl	Prepare a 10-10-100 Bordeaux and apply at leaf fall or as a dormant spray in late fall or early spring before buds begin to swell. If above sprays for Coryneum blight are made, peach leaf curl also will be controlled.
Almonds, Apricots, Cherries, Peaches, Nectarines, Plums, Prunes	Brown rot blossom blight	Prepare a 10-10-100 Bordeaux and apply at early pink bud on almonds and at red bud stage on other listed fruits except cherries. On cherries make spray at popcorn to full bloom.
Cherries (Sour)	Leaf spot	Prepare a 10-10-100 Bordeaux. Apply as a full coverage spray after petal fall or as recommended by the State Extension Service.
Cherries (Sweet)	Dead bud, Bacterial canker (Pseudomonas syringae)	Prepare a 12-12-100 Bordeaux. Apply at leaf fall and again in late winter before buds begin to swell. In wet cool Northwest U.S. winters, a third spray may be needed between above sprays.
Lemons, Oranges, Grapefruit	Phytophthora brown rot	Prepare a 3-2-6-100 Bordeaux and apply 10-25 gallons per tree to tree skirt, trunk and ground under tree. Apply in Nov.-Dec. just before or just after first rains. In severe brown rot season, make a second application in Jan.-Feb.
Lemons, Oranges, Grapefruit	Septoria fruit and leaf spot, Brown rot, and zinc and copper deficiency.	Make a 3-2-6-100 Bordeaux and spray in Oct., Nov. or Dec. before or just after first rains.
Walnuts	Walnut blight	Prepare a 15-10-100 plus one-half gallon summer oil emulsion. Apply in early prebloom 10-20% pistillate (not catkin blooms) are showing before or after rains. Repeat treatments after rains may be made. Use only if Bordeaux mixture has been shown to be non-phytotoxic in your area. To apply by aircraft, pre-mix not more than 16 lbs of Powdered Instant Bluestone and not more than 10 lbs of hydrated lime per acre, applied in not less than 30 gallons of spray per acre. Repeat as needed.
Grapes (Except California)	Downy mildew	Prepare and apply a 2-6-100 Bordeaux spray beginning when downy mildew is detected. Repeat as needed to achieve and maintain control. This mixture and its use will exhibit some phytotoxicity on most varieties.

Seller's guarantee shall be limited to the terms of the label and that product in its unopened package conforms to the chemical description on the label; and subject thereto the buyer assumes any risk to persons or property arising out of use or handling and accepts the products on these conditions

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