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US ENVIRONMENTAL PROTECTION AGENCY OFFICE OF PESTICIDES PROGRAMS REGISTRATION DIVISION (75-767) WASHINGTON, DC 20460	EPA REGISTRATION NO. 8123-118	DATE OF ISSUANCE JUN 11 1987
	TERM OF ISSUANCE Conditional	
	NAME OF PESTICIDE PRODUCT Liquid Copper Sulfate	

NOTICE OF PESTICIDE: REGISTRATION REREGISTRATION
 (Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended)

NAME AND ADDRESS OF REGISTRANT (Include ZIP code)

Frank Miller & Sons, Inc.
 13831 South Emerald Avenue
 Chicago IL 60627

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

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

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

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

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(4) provide that you:

1. Submit/cite all data required for registration/reregistration of your product under FIFRA section 3(c)(5) when the Agency requires all registrants of similar products to submit such data.
2. Make the labeling changes listed below before you release the product for shipment.
 - a. Add the phrase "EPA Registration No. 8123-118."
 - b. Modify the ingredients statement to read as follows:

ACTIVE INGREDIENTS
 Copper expressed as metallic* 99%

OTHER INGREDIENTS 1%

One gallon contains 4.5 lb. copper as metallic which equals 2.5 lb. copper sulfate pentahydrate or Bluestone.

Specific gravity of solution is 1.18

*from copper sulfate pentahydrate.

ATTACHMENT IS APPLICABLE

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SIGNATURE OF APPROVING OFFICIAL _____ DATE JUN 11 1987

1065

3. Submit one (1) copy of your final printed labeling before you release the product for shipment. Refer to the A-79 enclosure for a further description of final printed labeling.

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

A stamped copy of the label is enclosed for your records.

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

Enclosures

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LIQUID COPPER SULFATE

3/18/81
Label
306

Copper expressed as metallic
ACTIVE INGREDIENT
Copper sulfate anhydrous 15.0% *6%*
INERT INGREDIENTS 85.0%
(Copper as Metallic 6%)

One gallon contains 0.58 lbs. copper as metallic which equals 2.3 lbs. copper sulfate pentahydrate or Bluestone

Specific gravity of solution = 1.18

** From copper sulfate pentahydrate*

- ALGAE CONTROL IN IMPOUNDED WATERS, LAKES, PONDS, AND RESERVOIRS
- ALGAE AND POTOMOGETON POND WEED CONTROL IN POTABLE WATER OR IRRIGATION CONVEYANCE SYSTEMS
- PREPARATION OF A BORDEAUX SPRAY TO CONTROL CERTAIN PLANT DISEASES

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE SIDE PANEL OF LABEL FOR ADDITIONAL PRECAUTIONARY AND STATEMENT OF PRACTICAL TREATMENT

ACCEPTED
JUN 1 1987
with comments
8103-118

EPA Reg. No. 8123-
EPA Est. No. 8123-IL-1

NET CONTENTS: _____

CAUTION
PRECAUTIONARY STATEMENTS
HAZARD TO HUMANS AND DOMESTIC ANIMALS
Harmful if swallowed. Avoid contact with skin, eyes, or clothing.
STATEMENT OF PRACTICAL TREATMENT:
If in eyes or on skin, flush with plenty of water for at least 15 minutes. If in eyes, call a physician. If on skin, wash with soap and water. Remove contaminated clothing before reuse. If swallowed, promptly drink large quantities of milk, egg white or gelatin solution. If these are not available, drink large quantities of water. Call a physician immediately. Note to Physicians: Probably mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression, and convulsion may be needed.
ENVIRONMENTAL HAZARDS:
Trout and certain other fish species 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. If the entire water body is to be treated, treat only 1/3 to 1/2 of the water area in a single operation and wait 10 to 14 days between treatments. Consult your State Fish and Game Agencies before applying this product, especially to public waters. Do not contaminate water by cleaning of equipment or disposal of wastes. Avoid contact with or drift to desirable plants or crops since the concentrated product may cause injury.
NOTE: If treated water is to be used as potable water, the residual metallic 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 labelling.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.
STORAGE: This material undiluted is corrosive to metal and should not be allowed to remain in contact with metal application and spray equipment that are not stainless steel. Rinse spray equipment thoroughly after use. Preferably store and handle product in glass, plastic, fiberglass, stainless steel or other materials not corroded by strong acids. Store product above 32° F. Open dumping is prohibited. Do not stack more than four drums high. Leaking or damaged drums should be placed in overpack drums for disposal. Spills should be absorbed in sawdust or sand and disposed of in a sanitary landfill. Keep container closed when not in use. Do not store near fertilizers, seeds, insecticides, or fungicides.
PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

SOLD BY

FRANK MILLER & SONS, INC.
13831 S. Emerald Avenue
Chicago, Illinois 60627

AG-33 (16/84)
Page 1

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ALGAE CONTROL

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GENERAL INSTRUCTIONS:

This liquid copper sulfate product is easy and ready to use to control algae in potable or irrigation water including reservoirs, ponds, lakes, irrigation or potable water conveyance systems.

Copper sulfate effectively controls many species of both filamentous (mat forming green algae) and planktonic (single cell blue-green) algae. The dose of copper sulfate and control are affected by algae species, water hardness, water temperature, amount of algae present, as well as whether water is clear, turbid, flowing or static. Preferably water should be clear and above 60° F, with treatment made in the late morning on a sunny day. Static water usually requires less copper sulfate than flowing water. The harder the water, the higher the required dose of copper sulfate. When mats of filamentous algae are floating, the surface of these mats should be sprayed. 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 best to begin with a lower dose and increase the dose until the algae are killed. (A few algae species are resistant to copper sulfate treatment and may not be killed.) Repeat treatments may be needed to keep algae under control to the desired levels.

Treatment of algae can 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.

1. For Algae Control in Reservoirs, Lakes, and Ponds:

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 growth 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: First, 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 feet 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. Secondly, 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. If the genera of either filamentous or planktonic algae is not known, apply 3 to 6 quarts 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 6 to 8 quarts 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 species.

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 Anacyclois Aphanizomenon Gloeotrichia Gomphosphaeria Polycystis Rivularia	Cylindrosporum Oscillatoria Plectonema	Nostoc Phormidium	Calothrix Symplaca
Chlorophyceae (Green)	Closterium Hydrodictyon Spirogyra Ulothrix	Botryococcus Cladophora Coelastrum Draparnaldia Enteromorpha Gloeocystis Microspora Tribonema Zygnema	Chlorella Crucigella Desmidiium Golenkinia Oocystis Palmella Pithophora Staurastrum Tetraedron	Ankistrodesmus Chara Nitella Scenedesmus
Diatomaceae (Diatoms)	Asterionella Fragilaria Mastocira Navicula	Gomphonema Nitzschia Stephanodiscus Synedra Tabellaria	Cymbella Neidium	
Protozoa (Flagellates)	Dinobryon Synura Uroglena Volvox	Ceratium Cryptomonas Euglena Glenadinium Mallomonas	Chlamydomonas Hantzschia Paridinium	Eudorina Pandorina

PPM CuSO₄ pentahydrate = Quarts of this product
 *1/4 to 1/2 ppm = 1.2 to 2.4 qts/acre foot of water
 *1/2 to 1 ppm = 2.4 to 4.5 qts/acre foot of water
 *1 to 1-1/2 ppm = 4.5 to 6.8 qts/acre foot of water
 *1-1/2 to 2 ppm = 6.8 to 9.3 qts/acre foot of water

How to apply this Liquid Copper Sulfate Product: Dilute the recommended amount of this product in sufficient water to thoroughly and uniformly spray the water surface including any floating algae mats.

2. Algae Control in Irrigation and Potable Water Conveyance Systems:

Accurately determine the water flow rate in Cubic Feet per Second (C.F.S.) or gallons per minute (Gal/Min). One C.F.S. equals 450 Gal/Min. Treatment can be made by either the Continuous or Slug application method. Copper sulfate becomes less effective as the bicarbonate alkalinity increases and is significantly reduced when the bicarbonate alkalinity increases and is significantly reduced when the bicarbonate alkalinity exceeds about 150 ppm as CaCO₃ regardless if applied by either of the following methods.

For Algae Control by the Continuous Application Method, begin treatment when water is first turned into the system and continue until water flow is stopped, applying 5-3/4 to 11-1/2 fl. oz. (170 to 340 ml) per C.F.S. of water during each 24 hours. For Leafy and Sage Pondweed Control continuously apply 5 to 7 pints (2600 to 3300 ml) per C.F.S. of water during each 24 hours. Should copper sulfate fail to control pondweeds satisfactorily, it may be necessary to treat the ditch with either a suitable approved herbicide or use mechanical means to remove the excess growth. In either case resume copper sulfate addition as soon as possible.

For Algae Control using the Slug Application Method, apply 1 to 7 pints (410 to 3300 ml) per C.F.S. of water per treatment. Repeat about every 2 weeks as needed. A slug is usually necessary every 5 to 30 miles depending upon water hardness, alkalinity, and algae concentration.

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5 of 5

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 hydrate spray grade lime $Ca(OH)_2$ and the third figure is the gallons of water into which both ingredients are mixed. This spray formulation is usually applied to the point that the spray runs off of the plants. Various Bordeaux sprays including 8-8-100, 5-5-100, and 2-4-100 are commonly used on various crops.

To Formulate a Bordeaux Spray: For a 10-10-100 mix 4-1/3 gallons of this Copper Sulfate Liquid (which provides copper sulfate equal to 10 lbs. of copper sulfate pentahydrate) in spray water, then add spray grade hydrated lime and remaining water as given in the next section on Mixing a Bordeaux Spray. For a 3-2-6-100 Bordeaux spray, mix 3 lbs. zinc sulfate, 7 pints of this Copper Sulfate Liquid, 6 lbs. of spray grade hydrated lime to give 100 gallons final water.

Mixing a Bordeaux Spray: Fill a tank 3/4 full with water. Then with agitator running, pour in the required amount of this product. Add the hydrated lime by washing it through a bronze, stainless steel or plastic screen and finish filling tank with water. Continue agitation until all spray has been applied.

CROP	TO CONTROL	DIRECTIONS
Almonds, Apricots, Peaches, Nectarines	Shot-Hole Fungus	Prepare a 10-10-100 Bordeaux and apply as a dormant spray in late fall or early spring.
Almonds, Apricots, Cherries, Peaches, Nectarines, Plums, Prunes Sour Cherries	Brown Rot Blossom Blight	Prepare a 10-10-100 Bordeaux and apply when bud begin to swell.
	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.
Lemons, Oranges, Grapefruit	Phytophthora Brown Rot	Prepare a 3-4-100 Bordeaux where there is no history of copper injury or a 3-2-6-100 (Zinc, Sulfate-Copper Sulfate-Hydrated Lime-Gallons of water) Bordeaux. Spray 6 gallons on skirt of tree 3 to 4 feet high and 2 to 4 gallons on trunk and ground under tree. If <i>P. hibernalis</i> is present, use 10 to 25 gallons to completely cover each tree. Apply in Nov. or Dec. just before or after first rain. In severe brown rot season, apply second application in Jan. or Feb.
Lemons, Oranges, Grapefruit	Septoria Fruit and Leaf Spot, Central Cank, and Brown Rot and Zinc and Copper Deficiencies	Prepare a 3-2-6-100 Bordeaux and use 10 to 25 gallons to completely cover each tree. Apply in Oct., Nov., or Dec. before or just after first rain.
Walnuts	Walnut Blight	Prepare a 15-10-100 plus one-half gallon summer oil emulsion. Apply in early prebloom 10-20% pistillate (not when catkin blooms are showing) before or after rain. Use only if Bordeaux mixture has been shown to be non-phytotoxic in your area.

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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