1063
FM 23
8123-117

COPPER SULFATE GRANULES

ACTIVE INGREDIENT:	
Copper sulfate (pentahydrate)	99%
INERT INGREDIENTS:	1%
(Copper Expressed as Metallic 25.2%)	

ACCEPTED
AUG 22 1985
Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 8123-117

USED FOR:
*Algae control in impounded waters, lakes, ponds and reservoirs.
*Algae and Pondweed control in irrigation conveyance systems.
*Control root growth in sewers.

KEEP OUT OF REACH OF CHILDREN

DANGER

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Corrosive. Causes irreversible eye damage. Do not get into eyes. Wear goggles or face shield. May be harmful or fatal if swallowed.

STATEMENT OF PRACTICAL TREATMENT:

If in eyes immediately flush eyes with plenty of water for at least 15 minutes. For eyes call a physician. If swallowed drink promptly a large quantity of milk, egg white, or gelatin solution; if these are not available, drink large quantities of water. Call a physician immediately. Avoid alcohol.

NOTE TO PHYSICIAN:

Probable 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. When controlling algae in impounded waters, lakes or reservoirs (not including rice fields) and the entire body of water 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 waste.

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

STORAGE: Store product in a secure dry place. Keep product dry as product is water soluble. 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 clean, or disposed in accord with the disposal procedures below.
Store product only in original container. During storage, store pesticide separately to prevent cross-contamination of other pesticides, fertilizers, food and feed.

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

EPA REG. NO. 8123-
EPA EST. NO. 8123-IL-1

NET WEIGHT: _____

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

Copper sulfate effectively co[illegible] is many species of [illegible]mentous (mat fo[illegible]g green) and planktonic (single cell blue-green) algae. The dose of [illegible]per sulfate and control [illegible] 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 of 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 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. 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*
	Anabaena			
Cyanophyceae (Blue-green)	Anacystis	Cylindrospermum	Nostoc	Calothrix
	Aphanizomenon	Oscillatoria	Phormidium	Symploca
	Closterichie	Plectonema		
	Gomphosphaeria			
	Polycystis			
	Rivularia			
Chlorophyceae (Green)	Closterium	Botryococcus	Chlorella	Ankistrodesmus
	Hydrodictyon	Cladophora	Crucigenia	Chara
	Spirogyra	Coelastrum	Desmidium	Nitella
	Ulothrix	Draparnaldia	Golenkinia	Scenedesmus
		Enteromorpha	Oocystis	
		Gloeocystis	Palmella	
		Microspora	Pithophora	
		Tribonema	Staurastrum	
		Zygnema	Tetraedron	
Diatomaceae (Diatoms)	Asterionella	Gomphonema	Achnanthes	
	Fragilaria	Nitzschia	Cymbella	
	Melosira	Stephanodiscus	Naidium	
	Navicula	Synedra		
		Tabellaria		
Protozoae (Flagellates)	Dinobryon	Ceratium	Chalmydomonas	Eudorina
	Synura	Cryptomonas	Haematococcus	Pandorina
	Uroglena	Euglena	Peridinium	
	Volvox	Glenodinium		
		Mallomonas		

*1/4 to 1/2 ppm = .67 - 1.3 lbs/acre ft. *1 to 1-1/2 ppm = 2.6 - 3.9 lbs/acre ft.
*1/2 to 1 ppm = 1.3 - 2.6 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 water by several methods using various types of equipment. Granules are usually applied by dragging them in a burlap or finer mesh bag attached to a boat or float so that the bags are suspended in the top foot of water until the crystals are dissolved. Determine the quantity of crystals needed to treat the area following directions and cautions on this label. Drag the bag of crystals first near the shoreline and continue outward by moving the boat travels in parallel lines about 20 to 100 feet apart until area has been treated or until 1/3 to 1/2 of the surface area has been treated. Continue dragging bag over treated area until the required minimum dose is applied and all crystals are dissolved.

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various other application techniques may be used as long as the minimum required dose is applied uniformly to the water surface and crystals are dissolved when applied to the water. This includes dissolving crystals in water and spraying this solution over the body of water several types of calibrating and spraying equipment may be used. Observe previous caution on the effect of copper sulfate solution on various metals in spraying and mixing containers.

2. To Control Algae and the Potamogeton Pondweeds, leafy and sago, in irrigation conveyance systems, use the continuous application method selecting proper equipment to supply copper sulfate Granular Crystals as follows. For Algae Control, begin continuous addition of copper sulfate Granular Crystals when water is first turned into the system and continue throughout the irrigation season applying 0.1 to 0.2 lbs. per cubic foot per second per day. For Leafy and Sago Pondweed Control, use the same continuous feeder applying 1.6 to 2.4 lbs. per cubic foot per second per day. Note: For best control of leafy and sago pondweed, it is essential to begin copper sulfate additions when water is first turned into the system or ditch to be treated and continued throughout the irrigation season. Copper sulfate becomes less effective as the bicarbonate alkalinity increases. Its effectiveness is significantly reduced when the bicarbonate alkalinity exceeds about 150 ppm as $CaCO_3$. 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 excess growth. In either case resume copper sulfate addition as soon as possible.

To Control Algae in Irrigation Conveyance Systems Using the Slug Application Method make a dump of copper sulfate into the irrigation ditch or lateral at 1 to 2 lbs. per cubic foot per second of water per treatment. Repeat about every 2 weeks as needed. A dump is usually necessary every 5 to 30 miles, depending on water hardness, alkalinity and algae concentration. Copper sulfate becomes less effective as the bicarbonate alkalinity increases. Its effectiveness is significantly reduced when the bicarbonate alkalinity exceeds about 150 ppm as $CaCO_3$.

3. To Control Root Growth in Sewers:

Commercial, Institutional, and Municipal Sewers use as follows

General Information Roots of shrubbery and trees growing near sewer lines frequently penetrate sewer lines in search of moisture and nutrients, even through extremely small cracks, holes, or poorly sealed joints. These tiny root hairs, if not controlled, will continue to grow both in diameter and number causing tile breakage, gradual reduced flow, and frequently flow stoppage. Copper sulfate has successfully controlled roots for over 50 years in residential and commercial sewers.

Make treatment when the reduced flow rate thought to be caused by root growth is first noticed. Do not delay until stoppage has occurred. A slight flow is needed to move copper sulfate crystals to root growth. When roots accumulate sufficient copper sulfate to cause death, root decay will begin and flow rate should increase in 3 to 4 weeks. Since a copper sulfate treatment usually only kills those roots in the pipe, roots will regrow, requiring follow-up treatments. Generally a treatment is made in the spring after plants begin to grow, with the second treatment during late summer or early fall each year and or any time when reduced flow possibly caused by root growth is noted.

Sewers - Use 2 pounds of these crystals every 6 to 12 months applied into each junction or terminal manhole as a preventive measure. Add copper sulfate crystals during period of reduced flow; however, a small flow is essential. If reduced flow due to root masses is observed, but not completely stopped, add the copper sulfate in the next manhole above the reduced flow area. If completely blocked, use a rod to penetrate the mass so some flow begins before treatment.

Storm Drains - Use 2 pounds of copper sulfate crystals per drain per year. Apply during a period of light water flow. In dry weather, introduce a flow with a hose. If storm drains become almost plugged, repeat treatment 3 or 4 times at 2-week intervals.

Sewer Pumps and Force Mains - Place 2 pounds of copper sulfate crystals in a cloth bag at the storage well inlet. Repeat as needed.

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