



GRANULAR COPPER SULFATE

ACTIVE INGREDIENT	BY WEIGHT
COPPER SULFATE PENTAHYDRATE *	99.0%
OTHER INGREDIENTS	1.0%
TOTAL	100.0%

CAS #7758-99-8

*COPPER AS METALLIC, 25.1%

See back panel for specific pesticidal use directions and state restrictions.

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.)

FIRST AID	
If in eyes:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue to rinse eye. Call a poison control center or doctor for treatment advice.
If swallowed:	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything to an unconscious person.
If on skin or clothing:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
If inhaled:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth to mouth, if possible. Call a poison control center or doctor for further treatment advice.
Notes:	Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For non-emergency information concerning this product, call the National Pesticides Information Center (NPIC) at 1-800-858-7378 Monday through Friday 8:00 am to 12:00 pm Pacific Time (NPIC web site: www.npic.orst.edu). For emergencies, call the poison control center 1-800-222-1222 24 hours a day, 7 days a week.
NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Product causes eye irritation.	

NET WEIGHT 50 Lbs. (22.68 kilograms)

EPA REG. NO. 56576-1-12204

EPA EST. NO. 12204-NE-1

MANUFACTURED FOR

M-70-G

MID-AMERICAN RESEARCH CHEMICAL CORP.
P.O. BOX 927 • COLUMBUS, NE 68602-0927 • 402-564-7104

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS DANGER - PELIGRO

CORROSIVE: Causes irreversible eye damage. May be fatal if swallowed. Harmful if absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin. Do not breathe the dust or spray mist. Wear goggles or face shield, long-sleeved shirt and long pants, socks, shoes and chemical resistant gloves made of any waterproof material.

For applications in waters destined for use as drinking water, those waters must receive additional and separate potable water treatment. Do not apply more than 1.0 ppm as metallic copper in these waters.

PERSONAL PROTECTIVE EQUIPMENT

Mixers, loaders, applicators and other handlers must wear the following:

- Long-sleeved shirt and long pants,
- chemical-resistant gloves made of any waterproof material,
- shoes plus socks, and
- goggles or face shield.

Some materials that are chemical-resistant to this product are polyvinyl chloride, nitrile rubber, or butyl rubber. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection chart. Discard clothing and other absorbent materials that have been drenched or heavily contaminated by this product. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, 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. Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should 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

For direct aquatic use: This pesticide is toxic to fish and aquatic invertebrates. Waters treated with this product may be hazardous to aquatic organisms. Treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead algae and weeds. This oxygen loss can cause fish and invertebrate suffocation. To minimize this hazard, do not treat more than 1/2 of the water body to avoid depletion of oxygen due to decaying vegetation. Wait at least 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State or local agency with primary responsibility for regulating pesticides before applying to public waters, to determine if a permit is required.

Certain water conditions including low pH (≤ 6.5), low dissolved organic carbon (DOC) levels (3.0 mg/L or lower), and "soft" waters (i.e., alkalinity less than 50 mg/L), increases the potential acute toxicity to non-target aquatic organisms.

DIRECTIONS FOR USE

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

Do not apply this product in a way that will contact workers or other persons, 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 State or Tribal agency responsible for pesticide regulation.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. Do not enter or allow others to enter until sprays have dried.

SPRAY DRIFT MANAGEMENT

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and the method of application (e.g., ground, aerial, air-blast, chemigation) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product. **DROPLET SIZE:** Apply only as a medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles. **WIND SPEED:** Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition (approximately 3 to 10 mph), and there are no sensitive areas within 250 feet downwind. **TEMPERATURE INVERSIONS:** If applying at wind speeds less than 3 mph, the applicator must determine if a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions or stable atmospheric conditions. **OTHER STATE AND LOCAL REQUIREMENTS:** Applicators must follow all state and local pesticide drift requirements regarding application of copper compounds. Where states have more stringent regulations, they must be observed. **EQUIPMENT:** All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates.

INSTRUCTIONS FOR USE

Water hardness, temperature of the water, the type and amount of vegetation to be controlled, and the amount of water flow are to be considered in using **Granular Copper Sulfate** to control algae. Begin treatment soon after plant growth has started. If treatment is delayed until a large amount of algae is present, larger quantities of **Granular Copper Sulfate** will be required. Algal growth is difficult to control with **Granular Copper Sulfate** when water temperatures are low (less than 60° F) or when the water alkalinity is above 50 ppm. Larger quantities of **Granular Copper Sulfate** will be required to kill and control algae in water which is flowing than in a body of stagnant water. If possible, curtail the flow of water before treatment and hold dormant for approximately three days after treatment or until the algae have begun to die. When preparing a **Granular Copper Sulfate** solution in water, the mixing container should be made of plastic, glass, or a painted, enameled, or copper-lined metal container. It is best to treat algae on a sunny day when the heavy mats of filamentous algae are most likely to be floating on the surface where they can be sprayed directly. If there is some doubt about the concentration to apply, it is best to start with the lower concentration given in the Specific Instructions below.

Treatment of algae can result in oxygen loss from decomposition of dead algae. This loss can cause fish suffocation. Therefore, to minimize this hazard, treat no more than one-half of the water area in a single operation and wait at least 14 days between treatments. Begin treatments along the shore and proceed outward in bands to allow fish to move into untreated water. **NOTE:** If treated water is to be used as a source of potable water, the metallic copper residual must not exceed 1 ppm (4 ppm **Granular Copper Sulfate**).

CALCULATIONS FOR THE AMOUNT OF WATER IMPOUNDED AND FOR THE AMOUNT OF GRANULAR COPPER SULFATE TO BE USED: Calculate water volume as follows: (1) Obtain surface area by measuring of regular shaped ponds or mapping of irregular ponds or by reference to previously recorded engineering data or maps. (2) Calculate average depth by sounding in a regular pattern and taking the mean of these readings or by reference to previously obtained data. (3) Multiply surface area in feet by average depth in feet to obtain cubic feet of water volume. (4) Multiply surface area in acres by average depth in feet to obtain total acre-feet of water volume.

CALCULATE WEIGHT OF WATER TO BE TREATED AS FOLLOWS: (1) Multiply volume in cubic feet by 62.44 to obtain total pounds of water, or (2) Multiply volume in acre feet by 2,720,000 to obtain pounds of water.

CALCULATIONS OF ACTIVE INGREDIENT TO BE ADDED: To calculate the amount of **Granular Copper Sulfate** needed to achieve the recommended concentration, multiply the weight of water by the recommended concentration of **Granular Copper Sulfate**. Since recommended concentrations are normally given in parts per million (ppm), it will first be necessary to convert the value in parts per million to a decimal equivalent. For example, 2 ppm is the same as 0.000002 when used in this calculation. Therefore, to calculate the amount of **Granular Copper Sulfate** to treat 1 acre-foot of water with 2 ppm **Granular Copper Sulfate** (or 0.5 ppm metallic copper), the calculation would be as follows: 0.000002 X 2,720,000 = 5.44 lbs. **Granular Copper Sulfate**.

CALCULATION OF WATER FLOW IN DITCHES, STREAMS, AND IRRIGATION SYSTEMS: The amount of water flow in cubic feet per second is found by means of a weir or other measuring device.

SPECIFIC INSTRUCTIONS SEWER TREATMENT – ROOT DESTROYER *

ROOT CONTROL GENERAL INFORMATION: Plant roots can penetrate through small cracks and poorly sealed joints of sewer lines. If not controlled, these small roots will continue to grow larger in number causing breakage, reduced flow, and eventually, flow stoppage. **Granular Copper Sulfate** has been known to be an effective means to control roots in residential and commercial sewers.

COMMERCIAL, INSTITUTIONAL, AND MUNICIPAL SEWERS:

ROOT CONTROL IN SEWERS: As a preventive measure, apply into each junction or terminal manhole **2 pounds of Granular Copper Sulfate every 6 to 12 months.** At time of reduced flow (some water flow is essential), add **Granular Copper Sulfate.** If flow has not completely stopped, but has a reduced flow due to root masses, add **Granular Copper Sulfate** in the next manhole above the reduced flow area. For complete stoppage, penetrate the mass with a rod to enable some flow before treatment.

ROOT CONTROL IN STORM DRAINS: Apply when water flow is light. If no water flow, as in dry weather, use a hose to produce a flow. Apply **2 pounds Granular Copper Sulfate per drain per year.** It may be necessary to repeat treatments in 6 month intervals, if drains become nearly plugged.

SEWER PUMPS AND FORCE MAINS: At the storage well inlet, place a cloth bag containing **2 pounds of Granular Copper Sulfate.** Repeat in **6 or 12 month intervals,** if necessary.

RESIDENTIAL OR HOUSEHOLD SEWER SYSTEMS:

When a reduced water flow is first noticed, and root growth is thought to be the cause, treat with **Granular Copper Sulfate.** It is important not to wait until a stoppage occurs because some water flow is necessary to move the **Granular Copper Sulfate** to the area of root growth. Usually, within 3 to 4 weeks, after roots have accumulated sufficient copper sulfate, the roots will die and begin to decay and water flow should increase. As the roots re-grow, follow-up treatments with **Granular Copper Sulfate** will be required. Applications may be made each year in the spring after plant growth begins, or during late summer or early fall, or any time a reduced water flow, thought to be caused by root growth, occurs. Apply **2 pounds Granular Copper Sulfate** to household sewers. Add **Granular Copper Sulfate** to sewer line by pouring **1/2 pound increments** into the toilet bowl nearest the sewer line and flush, repeat this process until recommended dose has been added, or remove cleanout plug and pour entire recommended quantity directly into the sewer line. Replace the plug and flush the toilet several times. Repeat in **6 or 12 month intervals,** if necessary.

ROOT CONTROL IN SEPTIC TANKS, LEACH LINES AND LEACH LINE PIPES:

The majority of the **Granular Copper Sulfate** will settle in the septic tank itself and little will pass into the leach lines. To treat leach line pipes, add **2 pounds of Granular Copper Sulfate** to the distribution box located between the septic tank and the leach lines. To achieve effective root control in the leach lines it is necessary to transfer **Granular Copper Sulfate** from the septic tank to the leach lines. A cleanout plug opening may need to be installed if the distribution box does not have an opening leading to the leach lines. Repeat in **6 or 12 month intervals,** if necessary.

*NOTE: Do not apply **Granular Copper Sulfate** through sink or tub drains as it will corrode the metal drains.

*NOTE: **Granular Copper Sulfate** added to an active 300 gallon septic tank at 2 pounds per treatment will temporarily reduce bacterial action, but it will return to normal approximately 15 days after treatment. Trees and shrubbery growing near a treated line normally are not affected due to only a small portion of their roots being in contact with the **Granular Copper Sulfate.** **Granular Copper Sulfate** kills only those roots inside the leach line.

*NOTE: Do not use as a sewer additive where prohibited by State law. State law prohibits the use of this product in sewage systems in the State of Connecticut. Not for sale or use in the California counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma for root control in sewers. Not for sale or use in septic systems in the States of Florida, Massachusetts and Washington.

*NOTE: For all sewer line treatment applications do not use more than 2 lbs. **Granular Copper Sulfate** (0.5 lbs. metallic copper) per application. Minimum retreatment interval is 6 months. Make no more than two applications per calendar year. Per EPA guidelines, do not exceed 8 lbs. **Granular Copper Sulfate** (2 lbs. metallic copper) per year.

TO CONTROL ALGAE AND THE POTOMOGETON POND WEEDS, LEAFY AND SAGO, IN IRRIGATION SYSTEMS: Once the amount of **Granular Copper Sulfate** required for treating ditches or streams has been calculated, use a continuous application method, selecting proper equipment to supply the granular crystals. Minimum retreatment interval is 2 weeks.

FOR ALGAE CONTROL – Begin continuous addition application of **Granular Copper Sulfate** when water is first turned into the system and continue throughout the irrigation season, applying **0.1 to 0.2 lbs. Granular Copper Sulfate per hour per cubic ft per second for 12 hours of each 24 hours.**

This rate provides 0.112 to 0.224 ppm metallic copper in the treated water. **Maximum application rate is 4 ppm Granular Copper Sulfate** (1 ppm metallic copper). Note: 4 ppm **Granular Copper Sulfate** = 10.88 lbs. of product/acre ft. = 1.0 ppm metallic copper in the treated water.

FOR LEAFY AND SAGO POND WEED CONTROL – Use the same continuous feeder, applying **0.5 to 0.9 lbs. Granular Copper Sulfate per hour per cubic foot per second for 12 hours of each 24 hours.** This provides 0.5 to 1.0 ppm metallic copper in the treated water. **Maximum application rate is 4 ppm Granular Copper Sulfate (1 ppm metallic copper).**

NOTE: For best control of leafy and sago pond weed, it is essential to begin **Granular Copper Sulfate** additions when water is first turned into the system or ditch to be treated and to continue throughout the irrigation season. **Granular Copper Sulfate** becomes less effective as the alkalinity increases. Its effectiveness is significantly reduced when the bicarbonate alkalinity exceeds 150 ppm. Should **Granular Copper Sulfate** fail to control pond weeds satisfactorily, it may be necessary to treat the ditch with either a suitable approved herbicide or use a mechanical means to remove excess growth. In either case, resume **Granular Copper Sulfate** addition as soon as possible.

Useful formulas for calculating water volume flow rates:

Multiply the water volume in cu. ft. times 7.5 to obtain gallons.

1 C.F.S./Hr. = 27,000 Gals. 1 Acre Foot = 326,000 Gals.

1 ppm **Granular Copper Sulfate** = 0.25 ppm metallic copper

1 ppm **Granular Copper Sulfate** = 2.72 lb. of product/acre ft

TO CONTROL ALGAE IN IRRIGATION CONVEYANCE SYSTEMS USING THE SLUG APPLICATION METHOD: Make an addition (dump) of **Granular Copper Sulfate** into the irrigation ditch or lateral at **0.25 to 2.0 lbs per cubic foot per second of water per treatment.** Repeat on **2-week intervals** as required. Depending on water hardness, alkalinity and algae concentration, a dump is usually required every **5 to 30 miles.** Effectiveness of **Granular Copper Sulfate** decreases as the bicarbonate alkalinity increases and is significantly reduced when the alkalinity exceeds approximately 150 ppm as CaCO₃. **Maximum application rate is 4 ppm Granular Copper Sulfate (1 ppm metallic copper).**

APPLICATION METHODS TO CONTROL ALGAE IN IMPOUNDED WATERS, LAKES, PONDS AND RESERVOIRS:

There are several methods by which to apply **Granular Copper Sulfate** to impounded water. Probably the most satisfactory and simplest method is to dissolve the **Granular Copper Sulfate** in water and to spray this water over the body of water from a boat. A small pump mounted in the boat can easily be used for this purpose. Fine crystals may be **broadcast directly on the water surface** from a properly equipped boat. A specially equipped air blower can be used to discharge fine crystals at a specific rate over the surface of the water. When using this method, the direction of the wind is an important factor. Do not use this method unless completely familiar with this type of application. Where the situation permits, **Granular Copper Sulfate** may be **applied under the water by dragging burlap bags** containing **Granular Copper Sulfate.** The crystals are placed in burlap bags and dragged through the water by means of a boat. Begin treatment along the shoreline and proceed outward until one-third to one-half of the total area has been treated. Care should be taken that the course of the boat is such as to cause even distribution of the chemical. In large lakes, it is customary for the boat to travel in parallel lines about 20 to 100 feet apart. Continue dragging the burlap bags over the treated area until the minimum dosage is achieved and all crystals have been dissolved. Large or medium size crystals that dissolve slowly should be used with this method. **Granular Copper Sulfate** can be applied to impounded waters by injecting a solution in water via a piping system. **Note: Maximum application rate is 4 ppm Granular Copper Sulfate (1 ppm metallic copper).** Minimum retreatment interval is **14 days.** EPA sets the maximum application rate at 4 ppm **Granular Copper Sulfate;** however, based on the table below, 0.25 to 2 ppm **Granular Copper Sulfate** can be used to treat for specific genera of algae.

GRANULAR 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 waters (above 50 ppm alkalinity). Always consult State Fish and Game Agency before applying this product to municipal waters.

ORGANISM	0.25 to 0.50 ppm*	0.50 to 1 ppm*	1 to 1.5 ppm*	1.5 to 2 ppm*
Cyanophyceae	Anabaena	Cylindrospermum	Nostoc	Calothrix
(Blue-green)	Anacystis	Oscillatoria	Phormidium	Symploca
	Aphanizomenon	Plectonema		
	Gloetrichia			
	Gomphosphaeria			
	Polycystis			
	Rivularia			

ORGANISM	0.25 to 0.50 ppm*	0.50 to 1 ppm*	1 to 1.5 ppm*	1.5 to 2 ppm*
Chlorophyceae	Closterium	Botryococcus	Chlorella	Ankistrodesmus
(Green)	Hydrodictyon	Cladophora	Crucigenia	Chara
	Spirogyra	Coelestrum	Desmidium	Nitella
	Ulothrix	Draparnaldia	Golenkinia	Scenedesmus
		Enteromorpha	Oocystis	
		Gloeocystis	Palmella	
		Microspora	Pithophora	
		Tribonema	Staurostrum	
		Zygnema	Tetraedron	
Diatomaceae	Asterionella	Gomphonema	Achnanthes	
(Diatoms)	Frugilaria	Nitzschia	Cymbella	
	Melosira	Stephanodiscus	Neidium	
	Navicula	Synedra		
		Tabellaria		
Protozoa	Dinobryon	Ceratium	Chlamydomonas	Eudorina
(Flagellates)	Synura	Cryptomonas	Hawmatococcus	Pandorina
	Uroglena	Euglena	Peridinium	
	Volvox	Glennodium		
		Mallomonas		

* Copper Sulfate Crystals ppm (Cu metallic ppm) = lbs/acre ft
 0.25 - 0.5 ppm (0.0625 - 0.125 ppm) = 0.68 - 1.36 lbs/acre ft.
 0.5 - 1.0 ppm (0.125 - 0.25 ppm) = 1.36 - 2.72 lbs/acre ft
 1.0 - 1.5 ppm (0.25 - 0.375 ppm) = 2.72 - 4.08 lbs/acre ft
 1.5 - 2.0 ppm (0.375 - 0.50 ppm) = 4.08 - 5.44 lbs/acre ft

CONTROL OF ALGAE AND BACTERIAL ODOR IN SEWAGE LAGOONS AND PITS (Except California): Application rates may vary depending on amounts of organic matter in effluent stream or retention ponds. **Use 2 lbs. of Granular Copper Sulfate in 60,000 gals** (8,000 cu. ft.) of effluent to yield 1 ppm of dissolved copper. Dosage levels may vary depending upon organic load. Other Organic Sludges: The solution of crystals must be thoroughly mixed with sludge. **Dissolve 2 lbs** of crystals in 1-2 gals of water and **apply to each 60,000 gals** of sludge. **Maximum application rate is 4 ppm Granular Copper Sulfate** (1 ppm metallic copper). **Minimum retreatment interval is 14 days.**

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Keep pesticide in original container. Do not put concentrate or dilutions of concentrate in food or drink containers.

PESTICIDE DISPOSAL: 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. Open burning and dumping is prohibited.

(FOR RIGID, NONREFILLABLE CONTAINERS, EQUAL TO OR LESS THAN 50 LBS)

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration.

NOTICE: Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Seller. To the extent consistent with applicable law, Seller shall not be liable for consequential, special or indirect damages resulting from the use or handling of this product. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer. To the extent consistent with applicable law exclusive remedy of any buyer or user of this product for any and all losses, injuries, or damages resulting from or in any way arising from the use, handling or application of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid for this product or at Seller's election, the replacement of this product. SELLER MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.