

TENNESSEE BRAND®  
COPPER SULFATE PENTAHYDRATE

COPPER SULFATE CRYSTAL

**ACCEPTED**  
FEB 22 1996  
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 1812-374

GRANULAR                       MEDIUM                       LARGE

**ACTIVE INGREDIENT:**

Copper Sulfate (Pentahydrate)\* . . . . . 99.0%

**INERT INGREDIENTS** . . . . . 1.0%

**TOTAL** . . . . . 100.0%

\*Metallic copper equivalent 25.2%

**FOR**

(See back for specific use directions.)

- Alga : control in impounded waters, lakes, ponds and reservoirs
- Algae and pondweed control in irrigation conveyance systems
- Control root growth in sewers
- For manufacturing, repackaging, formulation of algaecides, fungicides, wood preservatives and also non-pesticidal uses\*
- When used for fertilizer:

Guaranteed analysis Copper (Cu) = 25.2%.

\*Each formulator using this product to formulate an end use pesticide product is responsible for obtaining an EPA registration for his end use product.

**KEEP OUT OF REACH OF CHILDREN  
DANGER**

**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. **NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

See back panel for additional Precautionary Statements.

**GRIFFIN CORPORATION**  
Valdosta, GA 31601

**EPA Reg. No. 1812-374**

**NET WEIGHT: 50 LBS (22.7 KG)**

## **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.

## **ENVIRONMENTAL HAZARDS**

**SPECIAL PRECAUTIONS** when applying this product directly to water as an algicide or herbicide: This pesticide is toxic to fish. Direct application of copper sulfate to water may cause a significant reduction in population 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 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 water increases. Do not contaminate water by cleaning of equipment or disposal of wastes.

**FOR MANUFACTURING USE:** This pesticide is toxic to fish and aquatic organisms. 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, except when product is labeled for use in sewers and bears such use instructions. For guidance contact your State Water Board or Regional Office of the EPA.

**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.

## **STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage or 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 of according to the procedures below. Store product only in original container. Store pesticide separately to prevent cross-contamination of other pesticides, fertilizers, food and feed.

**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.

**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 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 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 Copper Sulfate Crystal 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 Copper Sulfate Crystal 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.

<u>Organism</u>	<u>Dose</u>	<u>Algae Species</u>
Cyanophyceae (Blue-green)	1/4 to 1/2 ppm*	Anabaena, Anacystis, Aphanizomenon, Gloeotrichia, Gomphosphaeria, Polycystis, Rivularia
	1/2 to 1 ppm*	Cylindrospermum, Oscillatoria, Plectonema

	1 to 1-1/2 ppm*	Nostoc, Phormidium
	1-1/2 to 2 ppm*	Calothrix, Symploca
Chlorophyceae (Green)	1/4 to 1/2 ppm*	Closterium, Hydrodictyon, Spirogyra, Ulothrix
	1/2 to 1 ppm*	Botryococcus, Cladophora, Coelastrum, Droparnaldia, Enteromorpha, Gloeocystis, Microspora, Tribonema, Zygnema
	1 to 1-1/2 ppm*	Chlorella, Crucigenia, Desmidiium, Golenkinia, Oocystis, Palmella, Pithophora, Staurastrum, Tetraedron
	1-1/2 to 2 ppm*	Ankistrodesmus, Chara, Nitella, Scenedesmus
Diatomaceae (Diatoms)	1/4 to 1/2 ppm*	Asterionella, Fragilaria, Melosira, Navicula
	1/2 to 1 ppm*	Gomphonema, Nitzschia, Stephanodiscus, Synedra, Tabellaria
	1 to 1-1/2 ppm*	Achnanthes, Cymbella, Neidium
Protozoa (Flagellates)	1/4 to 1/2 ppm*	Dinobryon, Synura, Uroglena, Volvox
	1/2 to 1 ppm*	Ceratium, Cryptomonas, Euglena, Glenodinium, Mallomonas
	1 to 1-1/2 ppm*	Chlamydomonas, Haematococcus, Peridinium
	1-1/2 to 2 ppm*	Eudorina, Pandorina

\*1/4 to 1/2 ppm = 0.67-1.3 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 to control algae.

**Application by Dragging under Water:** Copper Sulfate Crystal can be applied by dragging them in a burlap or finer mesh bag attached to a boat or float so that bags are suspended in the top foot of water until the crystals are dissolved. Drag the bag of crystals first near the shoreline and continue outward by moving as 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. Determine the quantity of crystals needed to treat the problem area following direction and cautions on this label.

**Application by Spraying Solution on Water Surface:** Dissolve the minimum required dose of Copper Sulfate Crystal in water and spray the solution uniformly over the body of water. When spraying a solution of copper sulfate, mix copper sulfate in sufficient water to thoroughly spray the water surface. While the volume per surface acre depends on the type of spray equipment being used, spray volume should be approximately 20 to 500 or more gallons per acre of surface water. Several types of solutioning and spraying equipment may be used. Observe previous cautions on the effect of copper sulfate solution on various metals in spraying containers.

**Application by Broadcasting:** Dry Copper Sulfate Crystal can be broadcast on the water surface using a properly equipped boat. An air blower can be used to discharge these crystals at a specific rate over the surface of the water. When using this method, the wind direction is an important factor. Do not use this method unless completely familiar with this type of application.

**Application by Spraying from Airplanes and Helicopters:** Professional personnel licensed by the State Agricultural Extension Service are allowed to apply Dry Copper Sulfate Crystal in some states.

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 Crystal as follows: **For Algae Control:** Begin continuous addition of Copper Sulfate Crystal 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 feed 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  $\text{CaCO}_3$ . 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 Crystal into the irrigation ditch or lateral at 1/4 to 2 pounds 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  $\text{CaCO}_3$ .

**3. To control root growth in sewers\*:**

**Commercial, Institutional, and Municipal Sewers** use as follows:

**Sewers** - Use 2 pounds of Copper Sulfate Crystal every 6 to 12 months, applied into each junction or terminal manhole as a preventive measure. Add Copper Sulfate Crystal 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 Crystal 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 Crystal in a cloth bag at the storage well inlet. Repeat as needed.

**\*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.**

**NOTICE TO BUYER:** Seller warrants that this product conforms to the chemical description on this label and is reasonably fit for purpose stated on this label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, either expressed or implied.