

FRONT LABEL



KOCIDE CHEMICAL CORPORATION

Houston, Texas 77045

Kocide

**COPPER SULFATE
PENTAHYDRATE
K-4 CRYSTALS**

ACTIVE INGREDIENT
COPPER SULFATE
PENTAHYDRATE 99%
INERT INGREDIENTS ... 1%
TOTAL 100%

(METALLIC COPPER EQUIVALENT — 25.2%)

**KEEP OUT OF REACH
OF CHILDREN**

DANGER
EPA REG. NO. 8901-21

**FOR CONTROL OF ALGAE AND
POTOMOGETON POND WEEDS IN
IMPOUNDED WATERS, LAKES,
PONDS, RESERVOIRS, AND
IRRIGATION SYSTEMS**

100 LBS. NET

ACCEPTED

OCT 12 1979

Under the Federal Insecticide,
Fungicide, and ... Act,
as amended, for the pesticide
registered under
EPA Reg. No. 8901-12

See side/back panel for additional precautionary statements.

KOCIDE COPPER SULFATE PENTAHYDRATE

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS (& DOMESTIC ANIMALS) DANGER

CORROSIVE: Causes eye damage. Do not get in eyes. Wear goggles or face shield when handling. May be harmful or fatal if swallowed.

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes, call a physician. Remove and wash contaminated clothing before reuse. If swallowed, promptly drink a large quantity of milk, egg white or gelatin solution. If these are not available, drink large quantities of water. Call a physician immediately.

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

ENVIRONMENTAL HAZARDS: Trout or 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. Consult State Fish and Game Agencies before applying this product, especially in public waters.

GENERAL INSTRUCTIONS

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

Use KOCIDE Copper Sulfate Pentahydrate as noted below. When using KOCIDE Copper Sulfate Pentahydrate to control algae, there are many factors to consider: water hardness, temperature of the water, kind and amount of vegetation to be controlled, and amount of water flow. Algae can be controlled more easily and effectively if treatment with Copper Sulfate is made soon after plant growth has started. Small amounts of Copper Sulfate can effectively control algae in water. However, if treatment is delayed until a large amount of algae is present, larger quantities of Copper Sulfate may be required. Control of algae in water systems is not always permanent. Usually algae is more difficult to control with Copper Sulfate when water temperatures are low. The dose rates recommended for KOCIDE Copper Sulfate Pentahydrate are based on water temperatures of 60°F or above. Larger quantities of Copper Sulfate will also be required in hard water. Normally, larger quantities of Copper Sulfate will be required to kill 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 plants have begun to die. When preparing a Copper Sulfate solution in water, it is best that the mixing container be made of glass or plastic or if a metal container is used, that it be either painted, enameled, or copper-lined. The use of a galvanized container causes a chemical reaction to take place by which the copper displaces the galvanized coating of the container. It is usually best to treat algae on a sunny day when the heavy mats of filamentary algae are most likely to be floating on the surface where it can be sprayed directly. If there is some doubt about the concentration to apply, it is generally best to start with a lower concentration and to increase this concentration until the algae is killed.

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 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.

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 copper sulfate pentahydrate).

CALCULATIONS FOR THE AMOUNT OF WATER IMPOUNDED AND FOR THE AMOUNT OF 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 and feet to obtain cubic

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feet of water volume. (4) Multiply surface area in acres by average depth and 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 Copper Sulfate Pentahydrate needed to achieve the recommended concentration, multiply the weight of water by the recommended concentration of 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 Copper Sulfate Pentahydrate to treat 1 acre-foot of water with 2 ppm Copper Sulfate, the calculation would be as follows:

$$0.000002 \times 2,720,000 = 5.44 \text{ lbs. Copper Sulfate Pentahydrate}$$

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.

STORAGE AND DISPOSAL: Do not contaminate water, food, or feed by storage or disposal. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of according to procedures approved by Federal, State or Local disposal authorities. Before disposal of container triple rinse (or equivalent) and dispose of in an approved landfill or bury in a safe place. Consult Federal, State, or Local disposal authorities for approved alternative procedures.

SPECIFIC INSTRUCTIONS

TO CONTROL ALGAE AND THE POTOMOGETON POND WEEDS, LEAFY AND SAGO, IN IRRIGATION SYSTEMS:

Once the amount of Copper Sulfate required for treating ditches or streams has been calculated, use a continuous application method, selecting proper equipment to supply Copper Sulfate granular crystals as follows:

FOR ALGAE CONTROL — Begin continuous addition of granular Copper Sulfate when water is first turned into the system and continue throughout the irrigation system, applying 0.1 to 0.2 pounds per cubic foot per second per day.

FOR LEAFY AND SAGO POND WEED CONTROL — Use the same continuous feeder, applying 1.6 to 2.4 pounds Copper Sulfate Pentahydrate per cubic foot per second per day. NOTE: For best control of leafy and sago pond weed, it is essential to begin Copper Sulfate additions when water is first turned into the system or ditch to be treated and to continue throughout the irrigation system. Copper Sulfate becomes less effective as the alkalinity increases. Its effectiveness is significantly reduced when the bicarbonate alkalinity exceeds 150 ppm. Should 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 Copper Sulfate addition as soon as possible.

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

There are several methods by which to apply Copper Sulfate to impounded water. Probably the most satisfactory and simplest method is to dissolve the Copper Sulfate crystals in water and to spray this water over the body of water. 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, Copper Sulfate may be applied under the water by dragging burlap bags containing 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.

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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 municipal waters.

ORGANISM	¼ to ½ ppm*	½ to 1 ppm*	1 to 1½ ppm*	1½ to 2 ppm*
<i>Cyanophyceae</i> (Blue-green)	Anabaena	Cylindrospermum	Nostoc	Calothrix
	Anacystis	Oscillatoris	Phormidium	Symploca
	Aphanizomenon	Plectonema		
	Gloeotrichia			
	Gomphosphaeria			
	Polycystis			
	Rivularia			
<i>Chlorophyceae</i> (Green)	Closterium	Botryococcus	Chlorella	Ankistrodesmus
	Hydrodictyon	Cladophora	Crucigenia	Chara
	Spirogyra	Coelastrum	Desmidium	Nitella
	Ulothrix	Draparnaldia	Golenkinia	Scenedesmus
		Enteromorpha	Oocystis	
		Gloeocystis	Palmella	
		Microspora	Pithophora	
		Tribonema	Staurostrum	
		Zygnema	Tetraedron	
		Gomphonema	Achnanthes	
		Nitzschia	Cymbella	
		Stephanodiscus	Neidium	
<i>Diatomaceae</i> (Diatoms)	Asterionella			
	Fragilaria			
	Melosira			
	Navicula			
<i>Protozoa</i> (Flagellates)	Dinobryon	Ceratium	Chlamydomonas	Eudorina
	Synura	Cryptomonas	Hawmatococcus	Pandorina
	Uroglena	Euglena	Peridinium	
	Volvox	Glenodinium		
		Mallomonas		

* ¼-½ ppm = .67-1.3 lbs/acre ft
 * ½-1 ppm = 1.3-2.6 lbs/acre ft
 * 1-1½ ppm = 2.6-3.9 lbs/acre ft
 * 1½-2 ppm = 3.9-5.32 lbs/acre ft

NOTICE: KOCIDE CHEMICAL CORPORATION warrants that this product in its unopened package conforms to the chemical description on the label. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. This warranty does not extend to the handling or use of this product contrary to label instructions or under abnormal conditions or under conditions not reasonably foreseeable to seller and buyer assumes all risk of any such use.

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