

KHEMPAK
COPPER SULFATE
PENTAHYDRATE
CRYSTALS

ACCEPTED
JUL 11 1986
Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, this pesticide is
registered under
EPA Reg. No. 55711-1

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

(METALLIC COPPER EQUIVALENT...25.2%)

KEEP OUT OF REACH OF CHILDREN

DANGER - PELIGRO

SEE BACK PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS AND
STATEMENT OF PRACTICAL TREATMENT

NET WEIGHT - 50 POUNDS

KHEMPAK INDUSTRIES, INC.
HOUSTON, TEXAS 77562

EPA Reg. No. 55711-1
EPA Est. No. 56162-17-001

FRONT LABEL

BACK LABEL

KHEMPAK COPPER SULFATE PENTAHYDRATE

PRECAUTIONARY STATEMENTS

HAZARD TO HUMANS AND DOMESTIC ANIMALS

DANGER - PELIGRO

Causes severe eye and skin irritation. Harmful if absorbed through the skin or inhaled. May cause skin sensitization reactions in certain individuals. Avoid contact with the 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.

PRECAUCION AL USARIO: Si usted no lee ingles, no use este producto hasta que le etiqueta haya sido explicado ampliamente.

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: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic organisms. Do not apply directly to water except as directed under the specific instructions section. Drift and runoff from treated areas may be hazardous to fish and aquatic organisms in adjacent aquatic sites. Direct application of copper sulfate to water may cause a significant reduction in populations of aquatic invertebrates, plants and fish. Do not treat more than one-half of 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. Consult your State Fish and Game Agency before applying this product to public waters. Permits may be required before treating such waters.

ENDANGERED SPECIES RESTRICTIONS

It is a violation of Federal laws to use any pesticide in a manner that results in the death of an endangered species or adverse modification of their habitat.

The use of this product may pose a hazard to certain Federally designated endangered species known to occur in specific areas within

the following counties:

| STATE | SPECIES (Bulletin No.) | COUNTY |
|------------|--------------------------------------|--|
| CALIFORNIA | Solano Grass (EPA/ES-85-13) | Solano |
| TENNESSEE | Slackwater Darter (EPA/ES-85-04) | Lawrence Wayne Hancock |
| | Freshwater Mussels (EPA/ES-85-07) | Claiborne Hawkins Sullivan |
| ALABAMA | Slackwater Darter (EPA/ES-85-05) | Lauderdale Limestone Madison |
| VIRGINIA | Freshwater Mussels (EPA/ES-85-06) | Grayson Smyth Scott Lee Washington |

Before using this product in the above counties you must obtain the EPA Bulletin specific to your area. This bulletin identifies areas within these counties where the use of this pesticide is prohibited, unless specified otherwise. The EPA Bulletin is available from either your County Agricultural Extension Agent, the Endangered Species Specialist in your State Wildlife Agency headquarter, or the appropriate Regional Office of the U.S. Fish and Wildlife Service. THIS BULLETIN MUST BE REVIEWED PRIOR TO PESTICIDE USE.

GENERAL INSTRUCTIONS

KHEMPAK Copper Sulfate Pentahydrate can be used to control algae in irrigation systems, impounded waters, lakes, ponds and reservoirs. Application can be made by applying as a spray solution in water or as a granular addition to the water provided directions given under "specific instructions" are followed. Copper sulfate pentahydrate, when mixed with lime to form a Bordeaux mixture, can be used as a fungicide to control plant diseases. Other uses include sewer treatment and as a component in a wood preservative formulation. The specific instructions given on this label are based on general applications and circumstances.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Waste resulting from the use of this product may be disposed of on site or at an approved waste dump facility. CONTAINER DISPOSAL: Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill, by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

WARRANTY STATEMENT

KHEMPAK INDUSTRIES, INC. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth on the label when used according to directions under normal use conditions. 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.

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 such a manner as to directly or through drift expose workers or other persons. The area being treated must be vacated by unprotected persons. ✓

RE-ENTRY STATEMENT

Written or oral warnings must be given to workers who are expected to be in a treated area or in an area about to be treated with this product. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers. Written warnings must include the following information: DANGER - Area treated with Copper Sulfate Pentahydrate on (date of application). Do not enter treated area without protective clothing until spray has dried. In case of accidental exposure, wash all exposed skin areas with plenty of soap and water. Because certain states may require more restrictive re-entry intervals for various crops treated with this product, consult your State Department of Agriculture for further information.

AGRICULTURE PLANT DISEASE CONTROL

BORDEAUX MIXTURES: Bordeaux mix instructions are generally given as a series of three numbers, for example, 10-10-100. The first figure indicates the number of pounds of copper sulfate pentahydrate, the second number indicates the pounds of hydrated spray lime to be used and the third number is the gallons of water to be used. In some instances, a fourth number will be included, i.e. 3-10-10-100, and the first number then is the number of pounds of zinc sulfate to be used. To prepare a Bordeaux mixture, fill a mix tank one-quarter full with water. Then with an agitator operating, add copper sulfate pentahydrate by sifting through a copper, bronze, stainless steel or plastic screen. Add water to the three-quarters full level and add the hydrated lime through the screen. Use as a full cover spray to the point of runoff.

ALMONDS, APRICOTS, NECTARINES, PEACHES: Brown Rot Blossom Blight, Prepare a 10-10-100 Bordeaux mix and apply when buds begin to swell. Shot Hole Fungus, Apply a 10-10-100 Bordeaux mix as a dormant spray in late fall or early spring.

CHERRIES, PLUMS, PRUNES: Brown Rot Blossom Blight, Prepare a 10-10-100 Bordeaux mix and apply when buds begin to swell.

GRAPEFRUIT, LEMONS, ORANGES: Phytophthora Brown Rot, Prepare a 3-4 1/2-100 Bordeaux mix for use in areas with no history of copper injury or otherwise use a 3-2-6-100 (zinc sulfate - copper sulfate - hydrated lime - water) mix. Spray 6 gallons on skirt of trees 3 to 4 feet high plus 2 - 4 gallons on trunk and on ground under tree. If P. hibernalis is present, use 10 to 25 gallons to completely cover tree. Make application in Nov. or Dec. just before or after first rain. For severe brown rot pressure, make second application in Jan. or Feb. Septoria Fruit and Leaf Spot, Zinc and Copper Deficiencies, Apply 10 to 25 gallons of a 3-2-6-100 Bordeaux mix so as to completely cover each tree. Apply in Oct., Nov. or Dec. before or immediately following first rain.

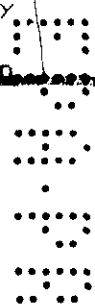
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SOUR CHERRIES: Leaf Spot, Apply a full cover 10-10-100 Bordeaux mix, spray after petal fall or as recommended by the State Extension Service. ✓

WALNUTS: Walnut Blight, Apply 15 pounds with 10 pounds of lime in 100 gallons of water plus one-half gallon summer oil emulsion. Apply in early pre-bloom 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. ✓

CONTROL OF ALGAE AND POTOMOGETON POND WEEDS IN IRRIGATION SYSTEMS

ALGAE: Begin continuous addition of granular copper sulfate pentahydrate at a rate of 0.1 to 0.2 pounds per cubic foot per second per day when water is turned into system and continue as long as system is operating.



LEAFY AND SAGO POND WEED: Using a continuous feeder, apply 1.6 to 2.4 pounds per cubic foot per second per day. For maximum effectiveness, it is necessary to begin addition when water is first turned into the system or ditch to be treated and to continue without interruption as long as the system is operating. The effectiveness of copper sulfate decreases with increased alkalinity especially when the bicarbonate alkalinity exceeds 150 ppm. If inadequate control of pond weeds is observed, it may be necessary to treat the ditch with an approved herbicide or by mechanical means. In either case, the addition of copper sulfate should be resumed as quickly as possible.

ALGAE CONTROL USING SLUG APPLICATION METHOD: Add copper sulfate into the irrigation ditch or lateral at 0.25 to 2.0 pounds per cubic foot per second of water each treatment. Repeat at approximate two week intervals as required. Additions are usually required every 5 to 30 miles depending on algae concentration and water hardness.

ALGAE CONTROL IN IMPOUNDED WATERS: Application of copper sulfate to impounded water may be accomplished by one of several methods. A simple method is to dissolve the copper sulfate in water and then spray the solution over the impounded water surface. A small pump mounted in the boat can easily be used for this purpose. A second method is to use a boat equipped with an air blower to broadcast fine crystals over the water surface at a specific rate. This method should be used only by persons familiar with the equipment and only when wind conditions will not cause excessive drift. A third method is to place large or medium size crystals in burlap bags and by means of a boat, drag the submerged bags through the water. Treatment should begin at the shoreline and continue outward to the middle of the impounded water. Even distribution is important to insure optimum results.

There are many genera of algae commonly found in waters of the United States. In general, algae can be controlled by using 0.25 to 2.0 ppm of copper sulfate pentahydrate. Lower rates are used for less severe infestations and higher rates for more severe infestations. Also, for equal levels of infestation, the lower levels are recommended in soft waters (less than 50 ppm methyl orange alkalinity) and the higher levels for hard waters (above 50 ppm alkalinity). 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 Pentahydrate To Be Used

A. Calculate water volume as follows:

1. Obtain surface area by measuring of regular shaped ponds or mapping of irregular ponds or by use of previously recorded data or maps.
2. Calculate average depth by sounding in a regular pattern and taking the mean of these readings or by use of previously recorded data.
3. Multiply surface area in square feet by average depth in feet to obtain cubic feet of water volume or
4. Multiply surface area in acres by average depth in feet to obtain total acre-feet of water volume.

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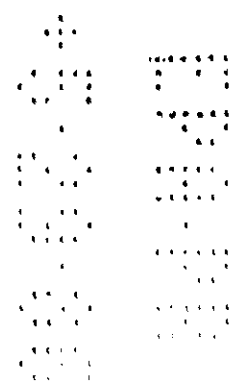
- B. Calculate weight of water to be treated as follows:
 1. Multiply volume in cubic feet by 62.44 to obtain total pounds of water, or
 2. Multiply volume in acre feet by 2,720,000 to obtain total pounds of water.

C. Calculate amount of copper sulfate pentahydrate to add:
 To calculate the weight of copper sulfate pentahydrate needed to achieve the desired concentration, multiply the weight of water in pounds by the recommended concentration. Since the recommended concentrations are given in parts per million (ppm), first convert the value to a decimal equivalent. A value of 1 ppm is equivalent to 0.000001 as a decimal value. Thus the amount of copper sulfate pentahydrate required to treat 1 acre-foot (2,720,000 pounds) of water with 1 ppm of copper sulfate pentahydrate would be:

$$0.000001 \times 2,720,000 = 2.72 \text{ lbs copper sulfate pentahydrate}$$

ALGAE IN RICE FIELDS: Apply 10 - 15 pounds copper sulfate per acre to the water surface as either a surface spray in water or crystals. Application should be made when the algae has formed on the soil surface but prior to rising to the water surface. Apply higher rate, i.e. 15 pounds, in water depth of six inches or greater.

TADPOLE SHRIMP IN RICE FIELDS: Apply 5 - 10 pounds of copper sulfate crystals per acre to the flooded field at any time the pest appears between planting time and until the seedlings are rooted and have emerged through the water surface. The lower rate should be used when the water depth and flow rate are minimal and the higher rate should be used when the water depth and flow are at a maximum.



SEWER TREATMENT - ROOT DESTROYER

PARTIAL STOPPAGE: Add 1/2 pound of copper sulfate to sewer or drain and flush toward blockage with 5 gallons of water. Repeat at 6 month intervals to prevent growth of new roots.

COMPLETE STOPPAGE: Physically remove the root blockage and repeat as above.

WOOD TREATMENT

GREEN PEELED POSTS: To prevent fungus decay and/or rot, prepare a solution of 18.0 pounds of sodium chromate in each 26 gallons of water to be used and a separate second solution of 18.0 pounds of copper sulfate in each 24 gallons of water to be used. Soak the peeled green posts, butt end down first in the copper sulfate solution for 3 days, then butt end down in the sodium chromate solution for 2 days, and finally turn the posts upside down in the sodium chromate solution for 1 additional day. Remove and rinse the posts with clear water. ✓

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