NET CONTENTS ______ GALLONS

MOUNTAIN BRAND COPPER SULFATE LIQUID

ACTIVE INGREDIENT

Copper sulfate anhydrous	15.0%
INERT INGREDIENTS	85.0%
(Copper as Metallic .... 6%)	

One gallon contains 0.68 lbs copper as metallic which equals 2.3 lbs copper sulfate pentahydrate or Bluestone. Specific gravity of solution = 1.18.

FOR:

- Algae control in impounded waters, lakes, ponds, and reservoirs.
- Algae and Potomogeton pond weed control in potable water or irrigation conveyance systems.
- Preparation of a Bordeaux spray to control certain plant diseases.
- Also for manufacturing, repackaging, formulating algaecides, fungicides, and other non-pesticidal uses.

ACCEPTED

Keep Out of Reach of Children

CAUTION

See side panel of label for additional precautionary and statement of practical treatment.

EPA Reg. No. 10103-10 EPA Est. No. 10103-CA-1

Cities Service Company
Mountain Chemicals Region
Pittsburg, California 94565

CAUTION

PRECAUTIONARY STATEMENTS HAZARD TO HUMANS AND DOMESTIC ANIMALS

Harmful if swallowed. Avoid contact with skin, eyes, or clothing.

STATEMENT OF PRACTICAL TREATMENT:

If in eyes or on skin, flush with plenty of water for at least 15 minutes. If in eyes, call a physician. If on skin, wash with soap and water. Remove contaminated clothing before reuse. If swallowed, promptly drink large quantities of milk, egg white or gelatin solution. If these are not available, drink large quantities of water. Call a physician immediately.

Note to Physicians: Probably 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. If the entire water body 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 wastes. Avoid contact with or drift to desirable plants or crops since the concentrated product may cause injury.

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 labeling

STORAGE AND DISPOSAL

STORAGE: This material undiluted is corrosive to metal and should not be allowed to remain in contact with metal application and spray equipment that are not stainless steel. Rinse spray equipment thoroughly after use. Preferably store and handle product in glass, plastic, fiberglass, stainless steel or other materials not corroded by strong acids. Store product above 35° F.

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited

PESTICIDE 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.

CONTANER DISPOSAL: Metal or Plastic-Triple rinse (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved State and Local procedures, or if plastic, by incineration if permitted by State and Local authorities

GENERAL: Consult Federal, State, or Local Disposal Authorities for approved alternative procedures

ALGAE CONTROL

General Instructions:

This liquid copper sulfate product is easy and ready to use to control algae in potable or irrigation water including reservoirs, ponds, lakes, irrigation or potable water conveyance systems.

Copper sulfate effectively controls many species of both filamentous (mat forming green algae) and planktonic (single cell blue-green) algae. The dose of copper sulfate and control are affected by algae species, water hardness, water temperature, amount of algae present, as well as whether water is clear, turbid, flowing, or static. Preferably water should be clear and above 60° F, with treatment made in the late morning on a sunny day. Static water usually requires less copper sulfate than flowing water. The harder the water, the higher the required dose of copper sulfate. When mats of filamentous algae are floating, the surface of these mats should be sprayed. 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 best to begin with a lower dose and increase the dose until the algae are killed or until safe use levels are reached (A few algae species are resistant to copper sulfate treatment and may not be killed.) Repeat treatments may be needed to keep algae under control to the desired levels

Treatment of algae can 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

The tolerance of fish to copper sulfate level in water varies with species as well as water hardness The following maximum levels of copper sulfate contained in this product have been reported to be safe levels for these fish species in average hardness and slightly alkaline waters should the entire body contain these levels

Fish Species	Qts/Acre Foot	Fish Species	Qts/Acre Foot
Trout	2-3	Gold fish	2-1/3
Carp	1-1/2	Perch	3-1/5
Suckers	1-1/2	Sunfish	6-1/3
Catfish	1-7/8	Black bass	9-1/2
Pickerel	1-7/8		

1. **For Algae Control in Reservoirs, Lakes, and Ponds:**

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: First, 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 Secondly, 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. If the genera of either filamentous or planktonic algae is not known, apply 3 to 6 quarts 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 6 to 8 quarts 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 considering the safe level and use for the fish species.

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

PPM $CuSO_4$ pentahydrate = Quarts of this product
- *1/4 to 1/2 ppm = 1.2 to 2.4 qts/acre foot of water
- *1/2 to 1 ppm = 2.4 to 4.5 qts/acre foot of water
- *1 to 1-1/2 ppm = 4.5 to 6.8 qts/acre foot of water
- *1-1/2 to 2 ppm = 6.8 to 9.3 qts/acre foot of water

How to Apply this Liquid Copper Sulfate Product: Dilute the recommended amount of this product in sufficient water to thoroughly and uniformly spray the water surface including any floating algae mats.

2. **Algae Control in Irrigation and Potable Water Conveyance Systems:** Accurately determine the water flow rate in Cubic Feet per Second (C.F.S.) or gallons per minute (Gal/Min). One C.F.S. equals 450 Gal/Min. Treatment can be made by either the Continuous or Slug application method. Copper sulfate becomes less effective as the bicarbonate alkalinity increases and is significantly reduced when the bicarbonate alkalinity exceeds about 150 ppm as $CaCO_3$ regardless if applied by either of the following methods

For Algae Control by the Continuous Application Method, begin treatment when water is first turned into the system and continue until water flow is stopped, applying 5-3/4 to 11-1/2 fl. oz. (170 to 340 mls) per C.F.S. of water during each 24 hours. **For Leafy and Sago Pondweed Control** continuously apply 5 to 7 pints (2600 to 3300 mls) per C.F.S. of water during each 24 hours. 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 the excess growth. In either case resume copper sulfate addition as soon as possible.

For Algae Control using the Slug Application Method, apply 1 to 7 pints (410 to 3300 mls) per C.F.S. of water per treatment. Repeat about every 2 weeks as needed. A slug is usually necessary every 5 to 30 miles depending on water hardness, alkalinity, and algae concentration.

BORDEAUX SPRAY PREPARATION
to control certain plant diseases

Understanding a Bordeaux formulation: As an example, if a Bordeaux spray recommendation reads 10-10-100, the first figure means the number of pounds of copper sulfate pentahydrate. The second figure means the pounds of hydrate spray grade lime $Ca(OH)_2$, and the third figure is the gallons of water into which both ingredients are mixed. This spray formulation is usually applied to the point that the spray runs off of the plants. Various Bordeaux sprays including 8-8-100, 5-5-100, and 2-6-100 are commonly used on various crops

To Formulate a Bordeaux Spray: For a 10-10-100 mix 4-1/3 gallons of this Copper Sulfate Liquid (which provides copper sulfate equal to 10 lbs of copper sulfate pentahydrate) in spray water, then add spray grade hydrated lime and remain[illegible] water as given in the next section on Mixing a Bordeaux Spray. For a 3-2-6-100 Bordeaux spray, mix 3 lbs zinc sulfate, 7 pints of this Copper Sulfate Liquid, 6 lbs of spray grade hydrated lime to give 100 gallons final water

Mixing a Bordeaux Spray: Fill a tank 3/4 full with water. Then with agitator running, pour in the required amount of this product. Add the hydrated lime by washing it through a bronze, stainless steel or plastic screen and finish filling tank with water. Continue agitation until all spray has been applied

CROP	TO CONTROL	DIRECTIONS
Almonds, Apricots, Peaches, Nectarines	Shot-Hole Fungus	Prepare a 10-10-100 Bordeaux and apply as a dormant spray in late fall or early spring
Almonds, Apricots, Cherries, Peaches, Nectarines, Plums, Prunes	Brown Rot Blossom Blight	Prepare a 10-10-100 Bordeaux and apply when buds begin to swell
Sour Cherries	Leaf Spot	Prepare a 10-10-100 Bordeaux. Apply as a full coverage spray after petal fall or as recommended by the State Extension Service
Lemons, Oranges, Grapefruit	Phytophthora Brown Rot	Prepare a 3-4½-100 Bordeaux where there is no history of copper injury or a 3-2-6-100 (Zinc Sulfate-Copper Sulfate-Hydrated Lime-Gallons of water) Bordeaux. Spray 6 gallons on skirt of tree 3 to 4 feet high and 2 to 4 gallons on trunk and ground under tree. If P.hibernalis is present, use 10 to 25 gallons to completely cover each tree. Apply in Nov. or Dec. just before or after first rain. In severe brown rot season, apply second application in Jan. or Feb.
Lemons, Oranges, Grapefruit	Septoria Fruit and Leaf Spot, Central Calif. and Brown Rot and Zinc and Copper Deficiencies	Prepare a 3-2-6-100 Bordeaux and use 10 to 25 gallons to completely cover each tree. Apply in Oct., Nov., or Dec. before or just after first rain.
Walnuts	Walnut Blight	Prepare a 15-10-100 plus one-half gallon summer oil emulsion. Apply in early prebloom 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.

Seller's guarantee shall be limited to the terms of the label and that product in its unopened package conforms to the chemical description on the label; and subject thereto the buyer assumes any risk to persons or property arising out of use or handling and accepts the products on these conditions