

TMB 471C

CONTROL OF ALGAE AND BACTERIA¹ IN RESERVOIRS & TANKS FOR WATER DESTINED FOR USE AS DRINKING WATER INTENDED FOR INDUSTRIAL USE

Active ingredients:	
Copper Sulfate Pentahydrate ¹	25%
Other ingredients	75%
Total	100%
¹ Equivalent to 6.3% metallic copper	
This product contains 0.52	

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 rinsing eye. Call a poison control center or doctor for treatment advice. **If swallowed:** Call 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 by mouth 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. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For emergency information, call the National Pesticides Information Center at 1-800-858-7378, 7:30 AM to 3:30 PM, Pacific time (PT), Mon.-Fri. During other times, call the poison control center at 1-800-222-1222.

NOTE TO PHYSICIAN:

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER. CORROSIVE. Causes irreversible eye damage and skin burns. May be fatal if swallowed. Harmful if inhaled. Do not get in eyes, on skin, or on clothing. Avoid breathing dust or spray mist. Wear goggles or face shield. Coveralls worn over long-sleeved shirt and long pants, socks, chemical-resistant footwear, and chemical-resistant gloves. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. For applications in waters destined for use as drinking water, these waters must receive additional and separate potable water treatment. Do not apply more than 10 ppm as metallic copper in those waters.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Mixers, loaders, applicators and other handlers must wear:

- Protective eyewear (goggles, face shield or safety glasses)
- long-sleeved shirt and long pants, shoes plus socks,
- and chemical-resistant gloves made of any waterproof material such as barrier laminate, butyl¹ rubber ≥14 mil; nitrile rubber ≥ 14 mil; neoprene rubber ≥ 14 mil; polyvinyl chloride (PVC) ≥ 14 mil; or vilon ≥14 mil.
- For overhead exposure, wear chemical-resistant headgear.

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. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate.

USER SAFETY RECOMMENDATIONS

- 1) Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- 2) 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

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 one-half of the water body and wait at least 14 days between treatments to avoid depletion of oxygen due to decaying vegetation (excluding water infrastructure and constructed conveyance such as drainage and irrigation canals, ditches and pipelines or intakes and aqueducts for drinking water or irrigation use). 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. **Fish Advisory Statement:** This copper product is toxic to fish and aquatic organisms. Unlike most organic pesticides, copper is an element and will not break down in the environment and will therefore accumulate in sediment with repeated applications. Copper is a micronutrient, but its pesticidal application rate exceeds the amount of copper needed as a nutrient. **IMPORTANT: Everywhere that bacteria is listed on this label refers to non-public health bacteria / bactericide.**

DIRECTIONS FOR USE

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

AQUATIC HERBICIDE RESISTANCE MANAGEMENT

- Water bodies or management units should be scouted prior to application to identify the weed species present and their growth stage to determine if the intended application will be effective. Water bodies or management units should be scouted after application to verify that the treatment was effective.
- Suspected herbicide-resistant weeds may be identified by these indicators:

- o Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
- o A spreading patch of non-controlled plants of a particular weed species; and
- Surviving plants mixed with controlled individuals of the same species.
- Implement the "Early Detection, Rapid Response Practice and Maintenance Control" by using the following practices where possible:
- o Identify weeds present in a management unit through scouting or history of the water body and understand the biology of target species.
- o Applications should target weeds when populations are small and there is low biomass, early in the season to maximize efficacy.
- o Applications should be made so that the herbicide contacts the weed. Use the appropriate application method for the use site/weed/chemical combination.
- o Weed escapes should not be allowed to go to seed or produce asexual vegetative propagules. • Use a diversified approach toward weed management. Whenever possible incorporate multiple weed-control practices such as mechanical control, biological management practices, and rotation of MOAs.
- o Time applications to have the highest probability for control and minimize need for follow-up control measures. Apply during conditions that minimize herbicide degradation (light, temperature/microbes) and/or dissipation (water exchange).
- Contact your local sales representative, local water management agency, or extension agent to find out if suspected resistant weeds to this MOA have been found in your region. If resistant biotypes of target weeds have been reported, use the application rates of this product specified for your local conditions. Tank-mix products so that there are multiple effective mechanisms of actions for each target weed.

USE DIRECTIONS

APPLICATION INSTRUCTIONS FOR AQUATIC USE**

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 biomass. This oxygen loss can cause fish and invertebrate asphyxiation. To minimize this hazard, do not treat more than one-half of the water body and wait at least 14 days between treatments to avoid depletion of oxygen due to decaying vegetation (excluding water infrastructure and constructed conveyances such as drainage canals, ditches and pipelines or intakes and aqueducts for drinking water or irrigation use). Begin treatment along the shore and proceed outward 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. Application of algacides to high density blooms of cyanobacteria can result in the release of intracellular contents into the water. Some of these intracellular compounds are known mammalian hepato- and nervous system toxins. Therefore, to minimize the risk of toxin leakage, manage cyanobacteria effectively in order to avoid applying this product when blooms of toxin-producing cyanobacteria are present at high density. In situations where rapidly reproducing toxic algal species pose a public health threat to drinking or recreational water resources, applicators must receive appropriate toxic algal species, local or tribal water resources authorities to apply copper at intervals shorter than 14 days should the circumstance demand. Certain water conditions including low pH (< 5.65), 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. The application rates on this label are appropriate for water with pH values > 6.5, DOC levels > 3.0 mg/L, and alkalinity greater than 50 mg/L. Avoid treating waters with pH values < 6.5, DOC levels > 3.0, and alkalinity less than 50 ppm (e.g., soft or acid waters), as trout and other sensitive species of fish may be killed under such conditions if present. Consult your state department of natural resources or fish and game agency before applying this product to public waters. Permits may be required before treating such waters.

•Excludes uses in swimming pools, spas, hot tubs, fountains, aquatic agriculture and livestock ponds.

Pre-Application Dose Determination:

For algae and aquatic plant treatments, applicators should conduct initial dose determination tests simulating a full-scale treatment program to determine the minimum efficacious concentrations for the target species, unless an effective dose is already known for the given target pest population.

FOR AQUATIC PLANT, ALGAE AND BACTERIA¹ CONTROL IN IMPOUNDED WATERS, LAKES, PONDS, LIVESTOCK WATERING SYSTEMS, RESERVOIRS, **SWIMMING AREAS, FARM, INDUSTRIAL, RETENTION AND GOLF COURSE PONDS, **AQUACULTURE PONDS, **BIOLOGICAL FISH PONDS OR SYSTEMS, IRRIGATION AND CHEMIGATION SYSTEMS

Apply this product through metering pump, sub-surface hoses or from a properly equipped moving boat into the body of water. No more than one-half of the body of water may be treated in a single application.

For small ponds and ornamental water features and fountains, apply this product by directly pouring 1.6 fluid ounces per 125 cubic feet (1/4 tsp/25 gals.) of water for 1 ppm of copper into the water around half of the perimeter of the body of water.

When applying from boat, use minimal speed to allow the prop wash to disperse and mix the product into the treated waters. Dispense up to 4.4 gallons per acre-foot (see use rate chart below). Apply in late spring or early summer when algae/bacterial first appear. For best results, disperse this product evenly to warm, still water on a sunny day when algae are near the surface. Several application points speed up dispersal.

Use rates vary, depending on algae/bacteria¹ species, water hardness, water temperature, and amount of algae/bacteria¹ present, as well as whether water is clear, turbid, flowing or static. Preferably, the water should be clear with temperatures above 60°F (15.6°C). Higher dosages are required at lower water temperatures, higher algae/bacterial¹ concentrations, and for hard waters. Static water requires less chemical for algae/bacterial control than does flowing water. Use higher dosages for Chara, Nitzschia, and filamentous algae (pond scum), and lower dosages for planktonic algae. If there is uncertainty about the dosage, begin with a lower dose and increase until control is achieved or until the maximum allowable level has been reached. See the "USE RATE" chart below.

In regions where ponds freeze in Winter, treatment should be done 6 to 8 weeks before expected freeze time to prevent masses of decaying algae under an ice cover.

Application Directions to Control Algae in Catfish Ponds

Applications are no longer needed in the Fall after algae are harvested or the average water temperatures fall below 70°F. Apply mid-morning at a rate of 0.31 pounds metallic copper (0.5 gals. of this product) per acre foot (0.11 ppm metallic copper). Place copper crystals in a cloth bag and then put the filled bag into another cloth bag to slow the rate at which the copper dissolves. Suspend the double bagged unit of copper about 20 feet in front of a paddlewheel aerator. Run the aerator until all the copper sulfate is dissolved; this usually requires an hour or two. Use copper only if you plan to harvest fish before fall and anticipate problems with off-flavoring algae. Do not make routine copper treatments for algae control in fingerling ponds or in broodfish ponds because off flavors are not a problem in those fish. Do not use this treatment regimen in waters of low hardness and alkalinity (less than 50 ppm as CaCO3) because copper may stress or kill fish.

Use Restrictions for Ponds, Lakes and Reservoirs

Maximum annual application rate of 21.9 pounds of metallic copper (35.3 gals. of this product) per acre foot (8 applications per year at up to 1 ppm). This rate/frequency is calculated based on staggering the treatment of each half of the water body every 14 days (at a rate of 2.74 lbs. metallic copper (4.4 gals. of this product) per acre-foot = 1 ppm) for 8 months (244 days). In situations where rapidly reproducing toxic algal species pose a public health threat to drinking or recreational water resources, applicators must receive authorization from applicable state, local or tribal water resources authorities to apply copper in excess of 21.9 lbs. of metallic copper (35.3 gals. of this product) per acre-foot (8 applications per year at up to 1 ppm).

**Not registered for use in California

CONTROL OF ALGAE / BACTERIA¹ IN RESERVOIRS AND TANKS FOR WATER DESTINED FOR USE AS DRINKING WATER

This product may be used in waters destined for use as drinking water. These waters must receive additional and separate potable water treatment. DO NOT apply more than 1.0 ppm as metallic copper.

Water intended for human use in municipal water reservoirs and tanks: To control algae/bacteria¹ in municipal water supplies before they are purified for drinking, apply 1.6 fluid ounces per 125 cubic feet (1/4 tsp/25 gals.) of water for 1 ppm of copper. Apply by boat or from side of reservoir tank at equal intervals.

Reservoirs of water intended for drinking water use: To control of algae/bacterial¹ in water reservoirs destined for use as drinking water, refer to the following table for specific application rates. Treated water must receive additional and separate potable water treatment. Applications may be repeated in 14 days. Apply by boat or from side of reservoir at equal intervals.

This Product (Gals.)	Water (Gals.)	Equivalent Metallic Copper (ppm)
0.26	326,000	0.06
0.40	326,000	0.09
2.64	326,000	0.60
4.40	326,000	1.00

In regions where ponds freeze in Winter, treatment should be done 6 to 8 weeks before expected freeze time to prevent masses of decaying algae under an ice cover.

The following are useful formula for calculating water volume and flow rates:

- To find the capacity of water storage containment in gallons, use the following formula:

Capacity of Water Storage Containment = Water Volume (cu. ft.) X 7.5

Note: 1 Cubic Foot per Second of Flow = 27,000 gallons per hour 1 Acre Foot = 326,000 gallons

• Calculate the Acre Foot of water in the body of water to be treated by calculating the surface area in square feet. Then divide by 43,560 (sq ft./acre) and then multiply by the average depth in feet.

1 Acre Foot of Water = an area of water measuring 43,560 sq. ft. x 1 foot deep

1 Acre Foot of Water = 43,560 cubic feet = 325,851.6 gallons

1 Cubic Foot of Water = 62.4 pounds

1 Acre Foot of Water = 43,560 x 62.4 = 2,720,000 pounds

Stock watering ponds, tanks, and troughs: To control of algae/bacteria¹ in stock water ponds, tanks, and troughs, add one-fourth teaspoon of this product to 35 gallons of water for a final ppm of 0.7 ppm. Do not exceed 1 ppm (1/4 tsp/25 gals). Apply by boat or side of tank or trough at equal intervals.

For drip-system use in livestock watering tanks: Tanks fed by a continuous flow of spring or well water may be equipped with a chemical drip system designed to meter-in this product based upon water flow rates. Adjust the systems to maintain a concentration of 0.7 ppm copper in incoming stock water (0.12 fl. oz. of product per minute to a water flow of 100 gallons per minute). Treat continuously or as needed to control and prevent algae regrowth.

Use Restrictions

Maximum annual application rate of 21.9 pounds of metallic copper (35.3 gals. of this product) per acre foot (8 applications per year, at up to 1 ppm). This rate/frequency is calculated based on staggering the treatment of each half of the water body every 14 days (at a rate of 2.74 lbs. metallic copper (4.4 gals. of this product) per acre-foot = 1 ppm) for 8 months (244 days). In situations where rapidly reproducing toxic algal species pose a public health threat to drinking or recreational water resources, applicators must receive authorization from applicable state, local or tribal water resources authorities to apply copper in excess of 21.9 lbs. of metallic copper (35.3 gals. of this product) per acre-foot (8 applications per year at up to 1 ppm).

IN NON-SPRINKLER, NON-D RIP IRRIGATION CONVEYANCE SYSTEMS AND CHEMIGATION SYSTEMS, DITCHES, CANALS, AND SIMILAR OPEN IRRIGATION CONVEYANCES

For continuous addition, add 1.7 fluid ounces of this product for each 1,000 gallons of water per hour. For conveyance systems longer than 30 miles, disperse this rate among injection points every 30 miles. Do not exceed the total dosage of 1 gallon of this product in 75,000 gallons of water (1 ppm metallic Cu). This method may only be used in constructed irrigation conveyance systems, laterals and aqueducts.

Use Restrictions: The maximum annual application rate is 13 pounds metallic copper (21.0 gals. of this product) per year per 5 miles of conveyance per cubic foot per second (CFS). Apply this product into irrigation conveyance systems or lateral at up to a maximum rate of 0.5 pound metallic copper (0.8 gal. of this product) per cubic foot per second of water per 5 to 30 mile treatment depending on water hardness, alkalinity and algae concentration.

TO CONTROL ALGAE / BACTERIA¹ IN SPRINKLER, DRIP OR OTHER TYPES OF CLOSED IRRIGATION EQUIPMENT

Use 1.6 gallons of this product per 7,500 to 300,000 gallons of water. Agitation is not required. Do not mix with basic substances. This product must be applied continuously for the duration of the water application.

EXAMPLE CALCULATIONS

Water Flow Rate (gpm)	Water Flow Rate (Cu. Ft./Min.)	Dosage Rate (ppm Metallic Cu)	This Product (Fl. Oz./Min.)	Feeder Pump Setting (mL/Min.)
3,000	400	0.06	0.3	8.9
6,000	800	0.06	0.6	17.7
9,000	1,200	0.06	0.9	26.6
12,000	1,600	0.06	1.2	35.5

CHEMIGATION & IRRIGATION FLOW RATES (1.0 ppm metallic Cu)

Water Flow Rate (Gals./Min./Ac.Ft.)	Water Flow Rate (Cu. Ft./Min.)	Dosage Rate (ppm Metallic Cu)	This Product (Fl. Oz./Min.)	Feeder Pump Setting (This Product, mL/Min.)
3,000	400	1.0	5.2	153.8
6,000	800	1.0	10.4	307.6
9,000	1,200	1.0	15.5	458.4
12,000	1,600	1.0	20.7	612.2

CONTROL OF ALGAE / BACTERIA¹ IN BIOLOGICAL FISH PONDS AND AQUACULTURE SYSTEMS

Before treating ponds containing fish with this product, measure total alkalinity (not hardness or pH). The toxicity of copper to fish increases as the total alkalinity decreases. Sensitivity to copper varies between fish species. For copper sensitive species, do not exceed 0.06 ppm metallic copper. When algae concentrations are high, to avoid asphyxiation of fish after treatment, either treat in a series of smaller doses over time or have emergency aeration available. Apply at the rate of 28 to 50 fl. oz. of this product per acre foot (326,000 gallons) of water to yield concentrations ranging from 0.05 ppm to .09 ppm metallic copper, respectively. Metallic copper concentration is directly proportional to amount of this product added per acre foot. A maintenance dose of 3 to 6 fl. oz. per acre foot may be used every 14 days. The rate is dependent on water temperature, fish density and the degree of suppression targeted.

Amount of This Product in Aquacultural Ponds Applied One Acre Foot (12 inches Deep)	Water (Gals.)	Metallic Copper (ppm)
0.22	326,000	0.05
This Product (Gals.)	Water (Gals.)	Metallic Copper (ppm)
0.40	326,000	0.09

FOR CONTROL OF BACTERIAL ODOR AND TOXIC GAS PRODUCED BY BACTERIAL ACTION

Apply up to 1 gallon of this product per 75,000 gallons (10,000 cubic feet) of organic matter (sewage). Application rates may vary depending on amounts of sewage in lagoons and pits. Apply by pouring this product into the pit or lagoon. Several application points speed up dispersal. For faster results, disperse this product evenly throughout sewage. Bacterial odors should be noticeably reduced in 1 to 2 weeks. Repeat application when odors recur. Minimum retreatment interval is 14 days.

Feedlot Runoff Lagoons: Add a portion of the required dosage of this product at several locations around the lagoon to speed dispersal of the product. A minimum of two applications per year (Spring and Fall) is recommended. Additional applications may be required as needed or when the lagoon is pumped.

Animal Confinement Pits: If these pits are located under the confinement buildings, add this product directly to these pits. If the pits are outside, add this product to transfer line to the pit.

Organic Sludge Pits: Apply 1 gallon this product in 75,000 gallons of sludge. Mix thoroughly.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage and disposal. **PESTICIDE STORAGE:** Store in original container. Keep container tightly closed. Store this product above 30oF. If this product freezes, allow to thaw and thoroughly agitate before use. Keep away from galvanized pipe and any nylon storage handling equipment. In the event of a spill, neutralize with limestone or baking soda before disposal. Concentrate may deteriorate concrete. **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.

CONTAINER HANDLING- Nonrefillable Container (rigid material: < 5 gallons): Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying. Triple rinse as follows: Fill the container one-fourth full with water and recap. Shake for 10 seconds. Four measure into application equipment or a 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 dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. **Nonrefillable Container (rigid material: > 5 gallons up to < 250 gallons):** Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container one-fourth full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, offer for recycling if available or dispose of empty container in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke. **Refillable Container (≥ 250 gallons & bulk):** Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

NOTICE: THORNTON, MUSSO & BELLEMIN, INC. warrants that this product in its unopened package conforms to the chemical description on the label. To the extent consistent with applicable law, THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. To the extent consistent with applicable law, 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.

Manufactured by:

Thornton, Musso & Bellemim
PO Box 181
Zachary, LA 70791



Thornton, Musso & Bellemim
WATER TREATMENT CONSULTANTS