

3. 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 this product 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 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 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.

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

* 1/4 to 1/2 ppm = .67 - 1.3 lbs/acre ft.

* 1/2 to 1 ppm = 1.3 - 2.6 lbs/acre ft.

* 1 to 1-1/2 ppm = 2.6 - 3.9 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 waters by several methods to control algae. Fine crystals are usually broadcast on the water surface using a properly equipped boat, or a water solution may be prepared and sprayed on the water surface. Broadcast applicators for Superfine Crystals may include, but not limited to, use of a cyclone type spreader attached to a boat for small ponds or a specially equipped air blower to spread the fine crystals at the desired rate over the surface of the water.

4. 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 Superfine Crystals as follows: For Algae Control, begin continuous addition of copper sulfate Superfine Crystals 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 feeder 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 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.

period by cultural practices, application may be delayed until immediately after the last cultivation); a second application may be made immediately following completion of harvest provided rainfall is expected. When two applications are used in one season, do not exceed 3 lbs. per acre per application. In Washington (irrigated crop) apply a single treatment of 4 lbs. per acre. If treatment is delayed until late winter or early spring, incorporation of the chemical in the top 1" to 2" of soil may substitute for lack of rain to activate the herbicide.

Newly Planted Crowns - California (San Joaquin Delta):
Make a single application of 2 to 4 lbs. per acre on soils high in clay or organic matter; use the lower rate on clay loams and the higher rate on peat soils. Do not use on soils containing less than 2% organic matter. Soil must be settled by rainfall or irrigation prior to treatment. Do not treat crowns planted to a depth of less than 2".

BARLEY, WINTER (Drill-Planted) - Western Oregon and Western Washington: Make a single application of 1½ to 2 lbs. per acre as soon as possible after planting but before emergence of barley. Do not replant treated areas to any crop within 1 year after last application as injury to subsequent crops may result.

CORN (FIELD):

Postemergence - Make a single application of ¾ lb. per acre in combination with non-pressure nitrogen solution. If nitrogen solution is not used, apply 1 lb. per acre; add 1 pt.

DIRECTIONS FOR USE

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

Storage and Disposal: Store product in a dry place. Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinse water that cannot be used according to label instructions must be disposed of in compliance with Federal or state waste management regulations, except where specifically exempted. Completely empty bag by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of bags in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

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 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.

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 Tadpole Shrimp in rice fields: Make application to the flooded fields any time the pest appears and repeat treatment as needed to provide adequate control. Apply 5 to 15 pounds of this product per acre. Treatment rate depends on the water depth and flow. Use a lower rate when water depth is shallow and flow is slow and increase dose as water depth increases and/or under higher flow rates.
2. To control algae in rice fields: Apply 10 - 15 pounds of this product per acre as needed to control algae in flooded rice fields or dissolve in water and make a surface spray. Repeat treatment if needed. Control is best obtained if application is made when algae are still growing on flooded soil surface before they begin to float. Use higher rate in deeper water (6 inches or greater).