

UPDATE: USE OF BLUESTONE (COPPER SULFATE) FOR ALGAE CONTROL

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Often, the existing literature on the use of copper sulfate does not consider water alkalinity and the presence of fish in the pond or lake to be treated. Fish populations in waters with total alkalinity values below 50 ppm (= mg/l, milligrams/liter) are sensitive to copper and may die if copper sulfate is used to treat algae. Alkalinity values below 50 mg/l are common throughout the state, particularly in west Kentucky.

Previously, the recommended rate of

application was 2-6 lbs of copper sulfate per acre foot of water with alkalinity values from 150 to 200 mg/l. Most water sources in Kentucky have alkalinity values well below that. As long as loss of fish is not a concern and label recommendations are carefully followed, the previously recommended rates for algae control are acceptable in low alkalinity waters.

If preserving fish populations and accuracy are important, water alkalinity must be checked and the following application rates should be used:

Total Alkalinity (mg/L)	Copper Sulfate Applied (lb/acre-foot)
Below 20	Copper sulfate should not be used
20	0.6
50	1.3
100	2.0
150	2.8
200	5.5
Above 200	Effectiveness of copper sulfate is greatly reduced

*Swimming pool supply companies usually carry an affordable kit that will test total alkalinity.

Carp, grass carp, goldfish, koi, trout and salmon are reported to be more sensitive to copper than other fish. Therefore, it may not be advisable to use copper sulfate in ponds stocked with these fish.

There are no restrictions regarding use of water treated with copper sulfate for irrigation, livestock or domestic purposes if copper sulfate was applied in accordance with the manufacturer's recommendations (read label carefully).

When applying copper sulfate, it should be distributed as evenly as possible over the pond surface. This may be accomplished by spraying, placing the chemical in a finely woven sack and dragging it by rope, or dissolving the

material in water and dispersing it slowly from behind a boat; criss-crossing the entire pond.

Copper sulfate is applied as a full pond treatment. In other words, a toxic concentration must be achieved for the entire pond volume. If a dense bloom of algae has covered most of the pond, copper treatment is not advisable. The treatment will likely cause a sudden, algal die off. An oxygen depletion could result as dead algae decay and the fish will suffocate. To avoid oxygen depletions, ponds with greater

than 30% algae coverage should not be treated with an algicide. A hand sprayer can be used for spot treatments to help control the growth of small, dense (thick) patches of algae in ponds with chronic algae problems or with 30-100% coverage. When using a hand sprayer for spot applications, a concentrated or supersaturated solution will help reduce the risk of an oxygen depletion when a full pond treatment is not possible; and minimizes the amount of copper added to the pond. A concentrated solution is mixed by filling a 2- to 5-gallon bucket with water and adding copper sulfate -- stirring constantly -- until no more will dissolve. The solution should be sprayed directly onto the patch of algae. Spot treatments can help limit algae problems, particularly in low alkalinity waters, as long as the area treated and the total amount of copper sulfate applied (less than 1/2 lb per acre foot) is small. Copper sulfate is corrosive to metal containers.

One species of algae, Pithophora, may be difficult to control. Simazine or Endothall may also be used for algal control. However, there are some aquatic use restrictions for these compounds (check label).

An acre foot is one surface acre of water with a depth of one foot. The number of acre feet is calculated by determining the number of surface acres of water and multiplying by the average depth of the entire pond. Average depth is determined by measuring pond depth at several different locations with a string attached to a weight. Add all measurements and divide by the number of readings collected. Accuracy will be increased by taking measurements from as many different locations as practical. Accurate volume determination is important since treatment doses are often slightly less than lethal doses where fish are involved.

Household Weight Conversions		
	Weight of Copper Sulfate (grams)	
Household Measure (level)	Snow (rice or sugar shaped grains)	Powder
1/4 tsp	1.6	1
1/2 tsp	3.2	2
1 tsp	6.4	4
1 Tbsp	19	12
1/4 cup	77	48
1/2 cup	154	96
1 cup	307	192
1.0 pound = 453.6 grams Weight in pounds = weight in grams divided by 453.6 1/4 cup copper sulfate snow weighs 77 grams Weight in pounds = 77 / 453.6 = 0.17 lb		