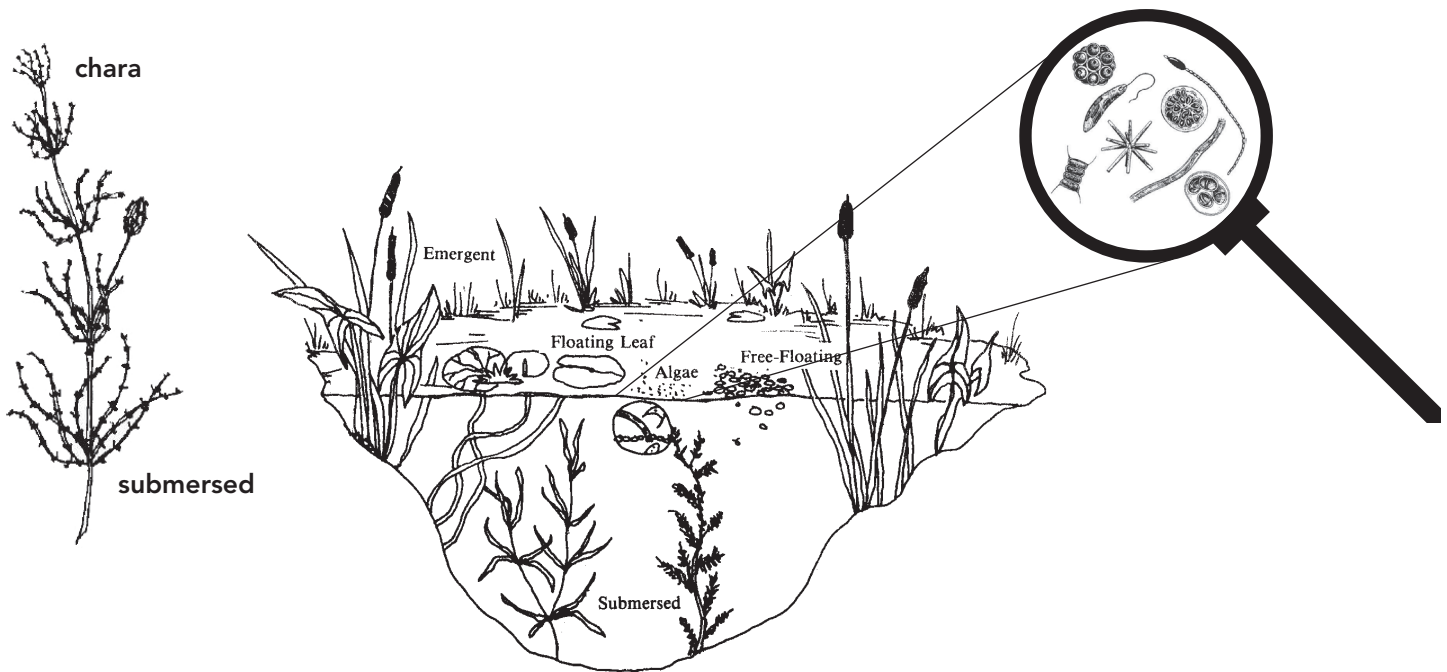


AQUAGUIDE



Missouri Department of Conservation—Aquatic Vegetation Management

Algae Control in Lakes and Ponds



Aquatic plants are a beneficial and necessary part of Missouri ponds and lakes. Without them, most other pond organisms cannot survive. Plants keep the water oxygenated, provide food, cover and nesting sites for fish, and stabilize the shoreline and pond bottom. Many healthy ponds have up to 30 to 40 percent of their area occupied by a diverse aquatic vegetation community. Control should be considered only if vegetation is causing a problem for the fish population or fishing access.


What are Algae?

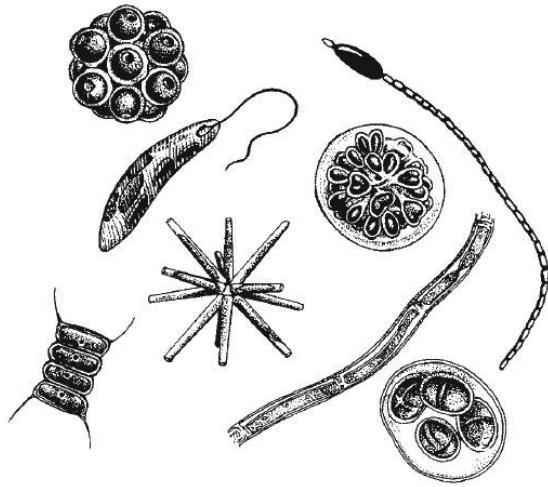
Algae are primitive aquatic plants common to virtually all Missouri waters. These simple plants differ from other plants by lacking true stems, leaves or roots. Algae are a basic component of a complex aquatic food web, converting the sun's energy into a form useful to other aquatic life. Algae are also a primary source of dissolved oxygen, which is a by product of their energy production. Algae occur in three basic forms: planktonic, filamentous and macrophytic.

Planktonic algae are single-celled, microscopic plants that float freely in the water. When these plants are extremely abundant or "bloom," they make the pond water turn green. Less often, they can turn the water other colors, including yellow, gray, brown or red.

Filamentous algae are sometimes referred to as "pond moss" or "pond scum." Filamentous algae occur as fine green threads that form floating mats, which are often moved around the pond by wind. This type of algae is also commonly found attached to rocks, submerged trees, other aquatic plants and boat docks.

Macrophytic algae resemble true plants in that they appear to have stems and leaves, and are attached to the bottom. The most commonly occurring macrophytic algae in Missouri is called chara or musk grass (due to its strong musky odor). Chara feels coarse to the touch, because of lime (calcium carbonate) deposits on its surface, earning it another common name—stonewort.

 **For more information** on the identification of aquatic vegetation, and issues dealing with aquatic plants in your pond, go to mdc.mo.gov/node/3365.



Algae Problems

Like many things that benefit us, too much algae can prove a drawback. Taste and odor problems in drinking water and sometimes even fish kills are associated with excessive blooms of planktonic algae. Filamentous algae and macrophytic algae often form dense growths that make fishing, swimming and other recreational uses nearly impossible. Total coverage can restrict sunlight penetration and limit the production of oxygen and food items necessary for good fish growth. Sometimes certain types of algae called blue-green algae or cyanobacteria can produce toxins that can cause illness in humans and even death in animals.

When algae abundance interferes with the intended use of the pond, a control method should be considered.

For more information on blue-green algae, go to lmvp.org/bluegreen.

Algae Control

Algae problems are usually caused by an overabundance of nutrients (nitrogen and phosphorous) in the pond. From the moment a pond is built, it becomes a settling basin for nutrients washing in from the land that drains into it (the pond's watershed). The older a pond gets, the more nutrients it has accumulated and the more susceptible it is to algae problems.

Runoff from fertilized fields, lawns and pastures, or from feedlots, septic tanks and leach fields accelerate nutrient loading and algae growth in the pond. If the pond is old and has become shallow due to accumulation of black muck on the bottom, it may be necessary to drain, dry and deepen the pond. Excavated material should be removed from the pond's watershed.

Planning

Establishing and maintaining a 100 foot or wider buffer strip of grass and trees around the pond's edge will help filter excess nutrients from runoff water. This combined with a 3:1 grade at the shoreline extending to depths of 5 or more feet will reduce the opportunities for macrophytic algae and other rooted plants to grow to nuisance levels in

the pond. A well-constructed lake or pond with adequate depth, a properly managed watershed and a diverse aquatic plant community covering 30–40 percent of the pond shoreline will have fewer problems with nuisance algae than shallow ponds that lack rooted aquatic plants.

The construction of small (4–6 feet in depth) silt retention ponds in the watershed will help settle out nutrients before they can enter the lake.

Eliminating yard fertilizers containing phosphorus from areas that drain into ponds will also reduce the potential for nuisance plant growth. Localized nutrient inputs from feedlots or other sources may be avoided by tiling, or by constructing a water diversion terrace below the nutrient source to direct its runoff away from the pond. Fencing livestock from the pond's edge and watering them from a tank below the dam is also a helpful protective measure.

For more information on these and other watershed and agriculture practices, go to nrqs.usda.gov to locate your Natural Resource Conservation Service office.

Mechanical Control

Mechanical control means removing the vegetation by hand. Mats of filamentous algae may be removed with a rake, seine, wire screen or similar devices. However, this control method is very labor intensive and provides only temporary control. In some instances, the algae may seem to grow as fast as it is pulled out. Mechanical control is practical when used in conjunction with chemical control methods or as a maintenance treatment around swimming or fishing areas for an occasional special event.

Algae removed from the pond should be deposited below the pond's dam to ensure that nutrients tied up in the vegetation do not re-enter the pond.

Algal surface scums can sometimes be controlled with a water pump that circulates the top layer of water in the pond.

For more information on the appropriate use of surface water pumps, go to mdc.mo.gov and select your county in the box titled "Who's My Local Contact" to locate your regional MDC fisheries personnel.

Biological Control

Biological control means using animals, insects or diseases to reduce the amount of nuisance plant coverage. Grass carp do not provide effective biological control of filamentous algae in fishing ponds. While very high densities of small grass carp have reduced filamentous algae in fish hatchery ponds that contain no rooted plants, these fish will switch to other plants (if available) once the fish grow larger than 5 inches. Large stockings of grass carp in fishing ponds could eventually eliminate all beneficial rooted plants and can actually encourage algae growth (filamentous and planktonic) by releasing nutrients from rooted plants after they are digested. Stocking 3–5 inch grass carp into ponds with established largemouth bass could result in the grass carp being eaten by the bass before they have the chance to grow.

Chemical Control

Directions, Restrictions and Warnings

ALWAYS READ THE PRODUCT LABEL FOR DIRECTIONS, CURRENT RESTRICTIONS AND WARNINGS. Before using chemicals, you should consider potential contamination of domestic water supplies and the waiting periods for watering livestock, eating fish, swimming and irrigation. Algae control with chemicals works best when the water temperature is above 60 degrees Fahrenheit and algae mats are broken up while the chemical is being applied.


To avoid oxygen depletion and a possible fish kill, avoid treating when the water temperature is above 80 degrees Fahrenheit and *treat only 1/4 to 1/3 of the vegetation at a time.*

Allow 10 days to two weeks between consecutive treatments. Chemicals do not provide permanent control, so repeated treatments are usually necessary to keep algae at desired levels. Please remember that the long term effects of most herbicides on the environment are not well known.

Currently recommended herbicides for algae control: Though these chemicals are recommended by MDC personnel and have proven reliable, other chemicals may be suitable for aquatic weed control.

	Cutrine Plus (Liquid)	Cutrine Plus (Granular)	Copper Sulfate
Planktonic Algae	approved	approved	approved
Filamentous Algae	approved	approved	approved
Macrophytic Algae	approved	approved	approved

Local farm or garden supply stores often carry these herbicides.

 **For more information** on pond or lake management, go to mdc.mo.gov/node/3117. To contact your regional MDC fisheries personnel, go to mdc.mo.gov and select your county in the box titled "Who's My Local Contact."

Missouri Department of Conservation Regional Offices

Central

3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City

12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northeast

3500 S. Baltimore
Kirksville, MO 63501
660-785-2420

Northwest

701 James McCarthy Drive
St. Joseph, MO 64507
816-271-3100



Ozark

551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast

2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Southwest

2630 N. Mayfair
Springfield, MO 65803
417-895-6880

St. Louis

2360 Highway D
St. Charles, MO 63304
636-441-4554

Determination of Acre-Feet to Calculate Total Amount of Herbicide Needed

If the acreage of the area to be treated is known, the number of acre-feet can be determined by multiplying the number of acres by the average depth (average depth = 1/3 of the maximum depth). For example: A two acre area is to be treated and has an average depth of three feet. The volume of the water is six acre-feet.

2 acres x 3 feet (average depth) = 6 acre-feet

If the dosage of herbicide recommended is 2 gallons of herbicide per acre-foot, the total herbicide needed would be twelve gallons.

6 acre-feet x 2 gallon/acre-foot = 12 gallons (total herbicide needed)

If the number of acres is not known, it can be estimated by measuring the number of square feet and dividing by 43,560. The number of square feet in many cases can be closely approximated by multiplying the average width in feet by the average length in feet. For example: A shoreline area is to be treated. The weeded area is 500 feet long and averages 10 feet wide. The total surface area is 5,000 square feet or 0.115 acres.

10 feet x 500 feet = 5,000 square feet

5,000 square feet ÷ 43,560 (square feet in an acre) = 0.115 acres

The average depth of water in this shoreline area is 1 foot. The total acre-feet is 0.115.

0.115 acres x 1 foot (average depth) = 0.115 acre-feet

If we assume that 4 gallon/acre-foot was the recommended dosage, then 0.46 gallons of herbicide would be needed.

4 gallon/acre-foot x 0.115 (acre feet) = 0.46 gallons (total herbicide needed)

Pond Area Estimator

