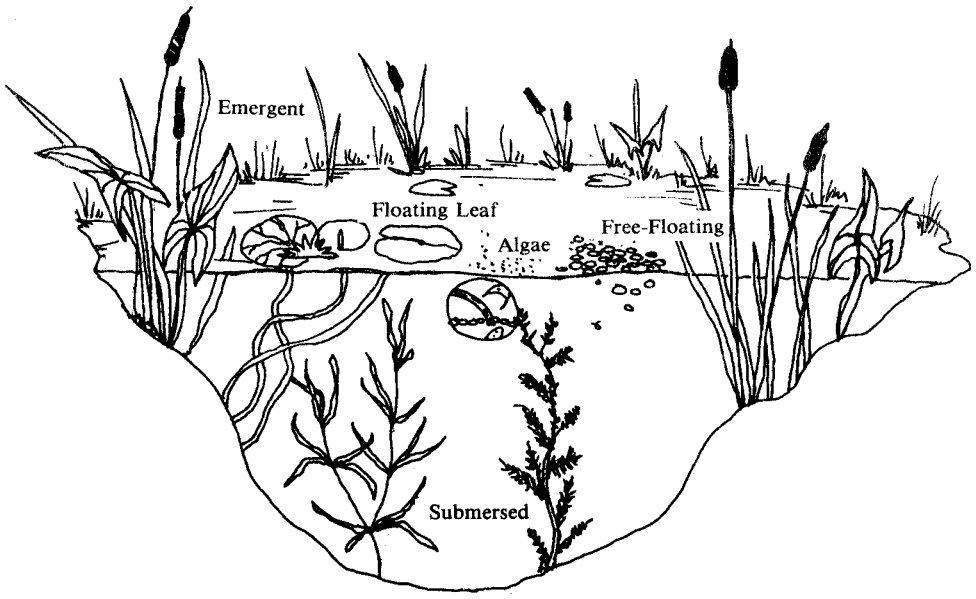
AQUAGUIDE

MISSOURI DEPARTMENT OF CONSERVATION

Floating Leaf Plant Control in Missouri Lakes and Ponds



Aquatic plants are a beneficial and necessary part of Missouri ponds and lakes. Without them, most other organisms cannot survive. Plants keep the water oxygenated, provide food, cover and nesting sites and stabilize the shoreline and pond bottom.

Several types of floating leaf plants are commonly found in Missouri waters. **Water shield, water lily, and American lotus** are examples of floating leaf plants that are often found in healthy ponds. Unfortunately, once established, they commonly spread to nuisance levels. Ideally, 10 to 20% of a pond's bottom and surface should be covered in aquatic plants. If more than 20% of the pond supports aquatic plants, or if vegetation is interfering with other pond or lake uses, mechanical, biological or chemical control methods should be considered.

Refer to our March 1993 publication entitled, "Nuisance Aquatic Plants in Missouri Ponds and Lakes" for more information on the identification of aquatic vegetation, and the benefits and drawbacks of having aquatic plants in your pond.

MECHANICAL CONTROL

SHADING areas with large sheets of black plastic (8 mil) will kill virtually all aquatic plants under the sheet within 30 days. Float the plastic on the surface and anchor by fastening the corners to concrete blocks, or sink the sheet over the weed bed with weights. Be sure to puncture the sheet in a number of places so gasses can escape.

WEEDING--Some aquatic plants can be controlled by pulling, digging, cutting, and raking. Weeding isn't a particularly enjoyable task, and you may have to get wet in the process. However, it may be effective if consistently practiced. Water shield and water lily can be kept in check by removing new growth at the base of the plants. Repeated cutting of leaves has been effective in controlling American lotus. Cutting should begin before the first flower buds open in June. If you have a large crop of lotus in a small pond, be sure to remove the majority of the cut leaves to avoid depleting the water of oxygen as they decay.

DEEPENING POND EDGES--Aquatic plants, like all other plants, cannot live without sunlight. As a result, the depth to which aquatic plants can grow in a pond or lake is totally dependent on how deep sunlight penetrates--the clearer the water, the deeper plants will grow. Deepening many of the pond's shallow areas to a depth below where light penetrates may reduce the severity of plant problems. Usually this technique requires that the water level be drawn down and the pond bottom be allowed to dry enough to allow access for a bulldozer or backhoe. If you can see the bottom of your pond or lake past a depth of five feet (a common characteristic of water bodies in the Ozarks), deepening the edges may be impractical as a means of plant control.

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. The black muck is a storehouse of nutrients that fuel the excessive growth of aquatic plants. All excavated material should be removed from the pond's watershed.

WATER LEVEL DRAWDOWN--Exposing sediments to prolonged freezing and drying during the months of December, January and February can be effective in controlling certain aquatic plants, if exposure lasts 2-4 weeks. However, both freezing and drying may be difficult to achieve because of the typically unpredictable weather during Missouri winters. If pond sediments remain wet, especially if insulated by a layer of snow, plant roots may not be sufficiently damaged to achieve the desired level of control.

Drain no more water than necessary to expose the unwanted plants and always leave at least eight feet of water in the deepest part of the pond to reduce the chance of a winter fish kill. Keep in mind that if the pond does not reach its normal level by spring and water clarity allows light to penetrate many feet below the surface, aquatic plants may grow even deeper than before the drawdown, expanding weed growth.

MINIMIZING NUTRIENT INPUTS--Excess nutrients (nitrogen and phosphorus) should not be allowed to wash into lakes and ponds. Plants in ponds can grow to nuisance levels in a short time if given the extra nutrients. Sources of nutrients may include runoff from feedlots, fertilized fields and yards, septic tank seepage and fish food. These nutrients will also accumulate naturally in the pond as the pond gets older.

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. The construction of small silt retention ponds in the watershed will help settle out nutrients before they enter the pond. Localized nutrient inputs from feedlots or other sources may be avoided by tiling, or 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. The Natural Resources Conservation Service(NRCS) office in your county seat can provide information on these and other practices.

BIOLOGICAL CONTROL

Grass carp (white amur) do not effectively control water shield, water lily or locust. The waxy coating (cuticle) and thick, fibrous stems of these plants make them difficult for grass carp to eat.

CHEMICAL CONTROL

Always read product labels for directions, current restrictions and warnings.

Before using chemicals, you should consider potential contamination of domestic water supplies and waiting periods for watering livestock, eating fish, swimming and irrigation, as described on the label. Although they provide good control when applied correctly, herbicides can harm desirable organisms if used improperly. The decay of large amounts of dead plant material following chemical application can lower dissolved oxygen to levels lethal for fish. Treat no more than 1/4 to 1/3 of the pond at 10- to 14-day intervals. For best results apply herbicides in spring and early summer, when plants are growing rapidly. Chemical control can be very expensive and only provide a temporary solution Periodic re-treatment is usually necessary. Please remember that the long-term effects of most herbicides on the environment are not well known.

CHEMICAL CONTROL

Currently recommended herbicides for floating leaf plant control and their suggested retail price. Though these chemicals have been tested by MDC and have proven reliable other chemicals may be suitable for aquatic weed control.

	Rodeo[1]	**Sonar-AS[2]**
Water Shield *Brasenia schreberi)*	approved	not recommended
Water Lily *(Nymphaea spp.)*	approved	approved
American Lotus *(Nelumbo lutea)*	approved	(partial control)
Minimum Quantity Available	1 quart	1pint
Approx.price per unit	$69.00	$250.00

[1]**Special Precautions:** RODEO will only work if the leaves are thoroughly wetted by the herbicide mixture and the mixture is allowed to sit undisturbed on the leaves until dry. Drying will require 2 to 6 hours. If water washes over the leaves any time during the drying period, the treatment will be ineffective. For best results, spray from shore on a calm day in bright sunlight (when the sun is high in the sky). A 2-gallon portable sprayer will work but has a limited range. Consider using a high pressure and volume gasoline powered pump for greater spraying range. If application is made from a boat, care should be taken not to disturb the mat of plants. Boat wake or wind may cause water to rinse over leaves and ruin the effectiveness of the application.

Rodeo and Water Shield: Although RODEO is not labeled for use on water shield, an MDC biologist determined it can be effective if special precautions are taken during application. Refer to the Special Precautions paragraph on Rodeo. Our biologist found the best time to treat water shield with RODEO was either when the plant was flowering (late June into July), or in October, approximately 2 weeks before the first frost. The recommended application rate is 1.6 ounces of RODEO (1 ounce = 2 tablespoons) and ½ ounce of a surfactant per gallon of water. This yields a 1 1/4 percent solution. Surfactants, sometimes referred to as "stickers," allow herbicides to stay on the treated surface.

Rodeo and Water Lily: RODEO is not labeled by Monsanto for use on water lily, partially because it has not been specifically tested on this plant. However, technicians at Monsanto feel that since RODEO has been shown to work on another member of the water lily family, spatterdock (also called yellow cow-lily), it may be effective if special precautions are taken during application. Refer to spatterdock under the "Weeds Controlled" section of the RODEO label for specific instructions, including dosage rates. Better results come from late summer or early fall application.

Rodeo and American Lotus: RODEO is labeled by its manufacturer, Monsanto, for use on American Lotus. Refer to the product label for specific instructions.

[2]**SONAR-AS:** SONAR is labeled by its manufacturer, Sepro, as controlling water lily but exhibiting only partial control on American lotus. Some applicators report poor success controlling either of these plants with SONAR.

Local farm supply stores often carry, or will order, these herbicides. For alternate sources of chemicals, a copy of the product label or clarification of this Aquaguide, check with your Regional Fisheries office or visit our MDC web-site at www.conservation.state.mo.us. Specific information on surfactants can be found on the product labels.

DRM 12/93
revised **RLN 1/99**
FIS - 103

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: If a two acre area is to be treated and it 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 gal/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

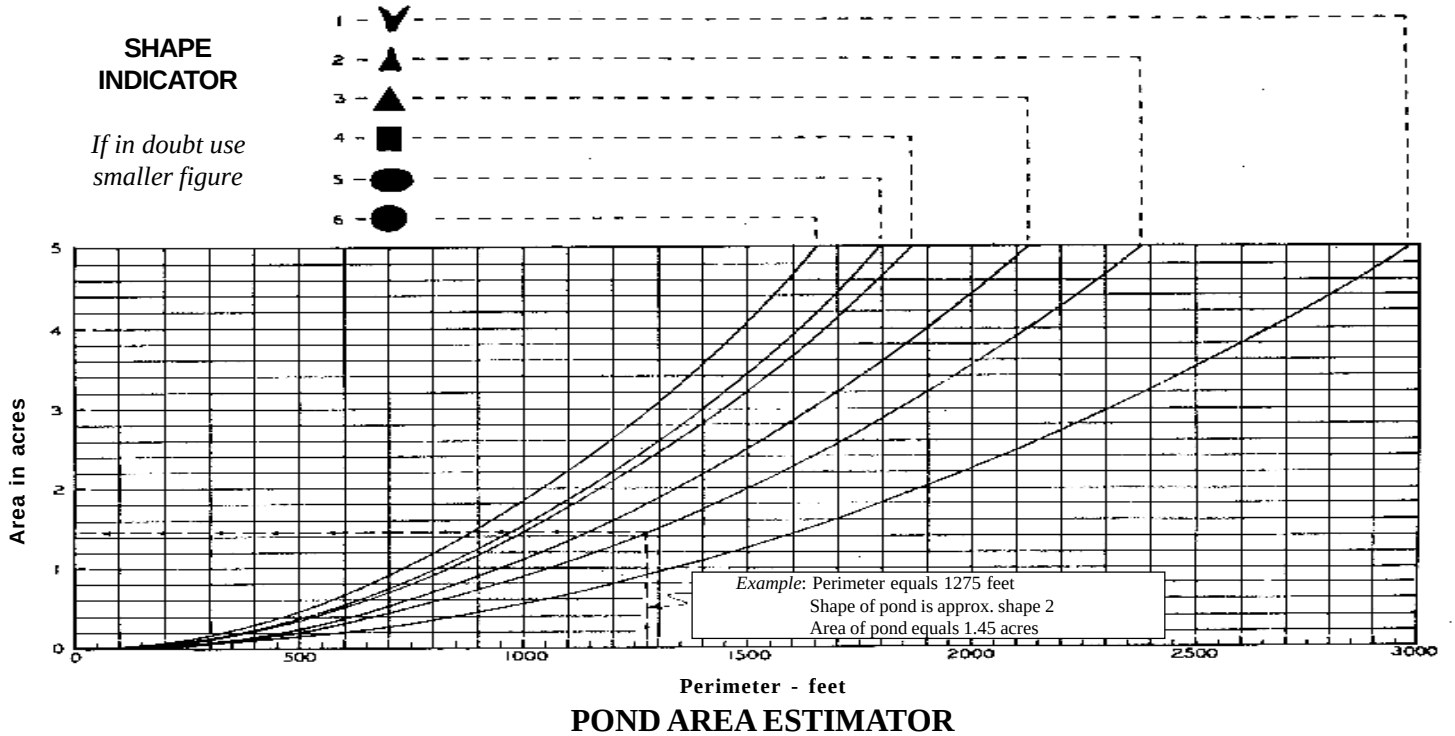
$$\frac{\text{5,000 square feet}}{\text{43,560 (square feet in an acre)}} = 0.115 \text{ acres}$$

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 gal/acre-foot was the recommended dosage, then 0.46 gallons of herbicide would be needed.

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



POND AREA ESTIMATOR