AQUAGUIDE

Missouri Department of Conservation

Duckweed and Watermeal Control in Ponds and Lakes

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.

Duckweed and watermeal are fast growing, floating aquatic plants that can sometimes reach nuisance densities in less than one month. Small amounts of these plants will not harm a good pond, but dense growths can block sunlight, reduce oxygen concentrations, and upset the natural pond balance. Refer to our publication "Nuisance Aquatic Plants in Missouri Ponds and Lakes" for more information on aquatic vegetation.

Ideally, 10 to 20 percent of a pond's bottom and surface should have aquatic plants. If more than 20 percent of the pond has aquatic plants, or if aquatic vegetation is interfering with some pond uses, mechanical, biological, or chemical control methods should be considered.

Mechanical Control

Manual

Seining with small mesh nets or with window-screen material can reduce coverage of free-floating plants in a small pond. Since free-floating plants reproduce so quickly, mechanical methods are only temporary solutions.

Biological Control

Grass Carp (*Ctenopharyngodon idella*)

The grass carp (or white amur) is a plant eating member of the minnow family, and may eat some duckweed and watermeal, but these plants reproduce so quickly that they can cover a one-acre pond in two months. For this reason, grass carp are generally not an effective control measure.

Chemical Control

ALWAYS READ AND FOLLOW THE PRODUCT LABEL FOR PRECAUTIONS, DIRECTIONS, RESTRICTIONS AND WARNINGS.

Herbicide Use Considerations

1. Proper identification of aquatic plants is critical prior to applying herbicide as different aquatic plants require different herbicides for control.
2. Herbicides rarely eradicate aquatic plants and usually provide temporary control. Retreatment each year might be necessary to control the nuisance vegetation.
3. Read herbicide label for personal protective equipment needed, and restrictions associated with watering livestock, swimming, or irrigation and proper application techniques.
4. Treat the target aquatic plants when they are actively growing, and water temperatures are between 65°F and 80°F. (Typically mid-May through late-June)
5. Treat no more than one-third of the target aquatic plants at 10-day to two-week interval. Dying and decaying aquatic plants remove dissolved oxygen from the water through decomposition. A possible fish kill could result if too much of the target aquatic plant is treated at once.
6. Some herbicides require the use of another product called a surfactant in order to be effective. The surfactant, or "sticker" binds the herbicide to the plant leaf and enables it to "work."

Herbicides can be purchased online or from local farm supply stores.

Herbicides that Provide Control for Duckweed and Watermeal

	Carfentrazone	Diquat	Flumioxazin	Fluridone	Penoxsulam
Duckweed	E	G	E	E	E
Watermeal	G		E	E	G

E = Excellent G = Good

Notes:

- *Start treating as soon as you notice new growth. The seeds of some plants stay viable for many years.*
- *Using a combination of treatment methods is often the best way for lasting plant control.*
- *Treat any duckweed that may have washed up on the bank*
- *Treat when the water surface is calm.*
- *Do not treat when the pond is muddy.*

For alternate sources of chemicals and more information on treating aquatic plants, contact your local MDC office or visit **mdc.mo.gov**.

Additional Options

If the above approaches do not work for your situation, or to maintain long term control, you might need to reduce nutrient inputs into your pond or lake. The final approach would be a total pond renovation.

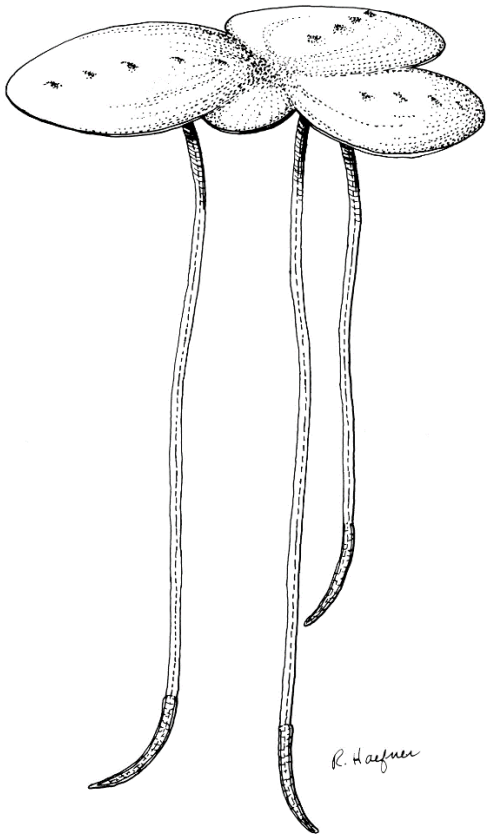
Minimizing Nutrient Inputs

Excess nutrients (nitrogen and phosphorus) should not be allowed to wash into ponds and lakes. Aquatic 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 or lawns, septic tank seepage, and access by cattle. Nutrients will also accumulate naturally 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 tilling 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 for your area can provide information on these and other practices.

Pond Renovation

Draining a pond and drying the basin might be necessary to remove years of sedimentation and accumulation of black muck. This material is a storehouse for nutrients and seeds. 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. All excavated material should be removed from the pond's watershed.



Duckweed *(Lemna spp.)*

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 12 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 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

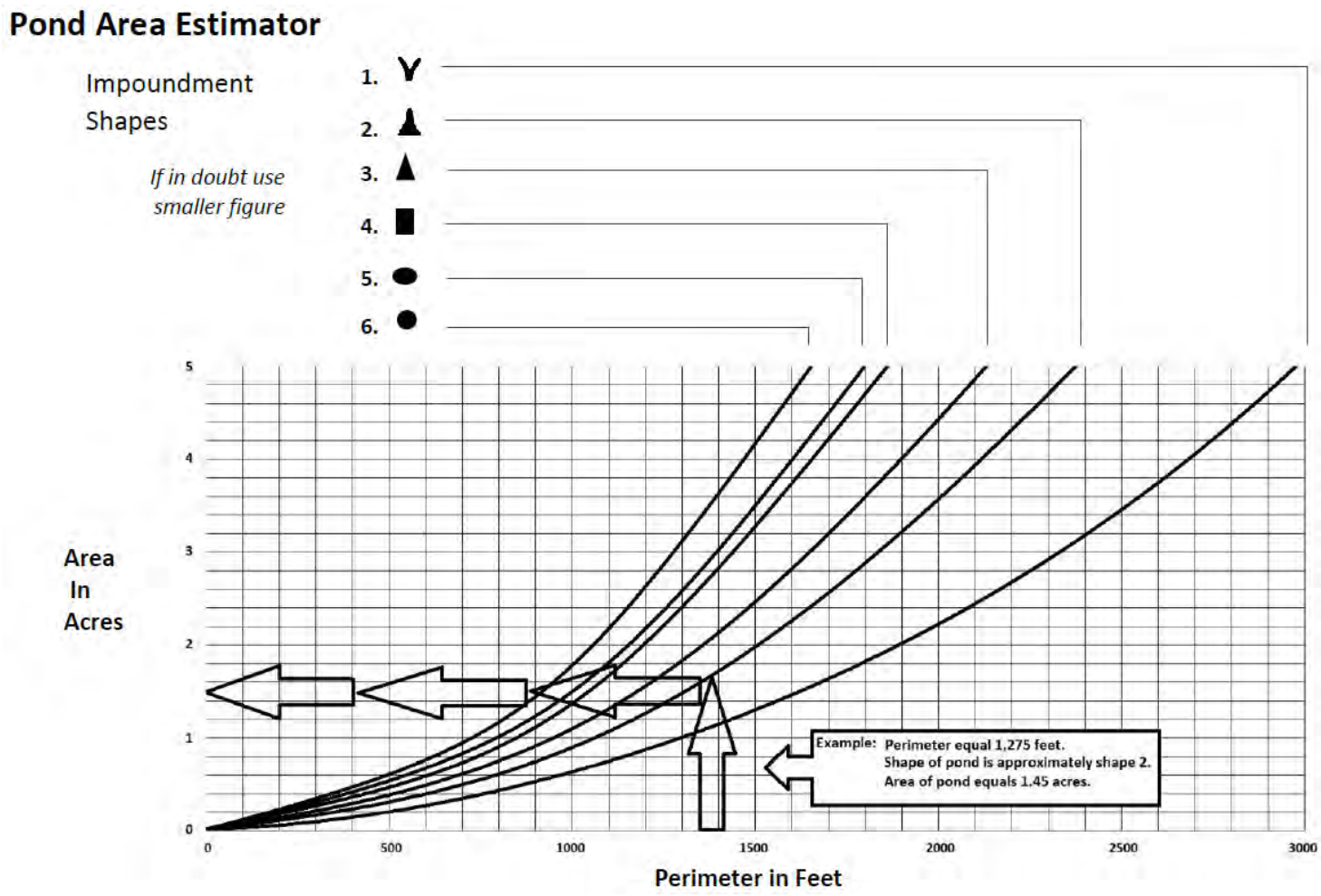
43,560 (square feet in an acre)

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

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

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

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



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