

Aquatic Plant Identification and Management Workbook, Series 4

The *Aquatic Plant Identification and Management Workbook Series* is designed to acquaint pond owners in Maryland with naturally-growing aquatic plants and the general means for managing their growth. Aquatic plants play an important role in the natural ecology of ponds: they provide food and shelter for many fish, aquatic animals and other wildlife, and they provide oxygen, which can benefit fish production.

Sometimes, however, growth gets out of hand and the plants become so numerous they interfere with the intended

use of the pond, for example, fishing, swimming, boating — they are then called aquatic weeds. When this occurs, control measures often become necessary.

The suggested chemical controls in this workbook series are intended as guidelines and must not replace directions on chemical labels. Separate fact sheets display each of the aquatic plants in this series and are available from the Maryland Sea Grant Extension Program or your local Cooperative Extension Office.

FLOATING VEGETATION

Watermeal

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Vascular flowering aquatic plants are seedbearing and are characterized by a system of conductive and supportive tissue. They can be classified into several broad categories of vegetation: floating, submersed, emergent, and terrestrial. This fact sheet focuses on watermeal, a floating plant.

Floating vegetation includes plants that have no roots but float freely, and plants such as the water lily that are rooted to the pond bottom but have leaves that float on the surface. Both types derive all their nutrients directly from the water either through the cell wall or through a highly vascularized root system.

WATERMEAL

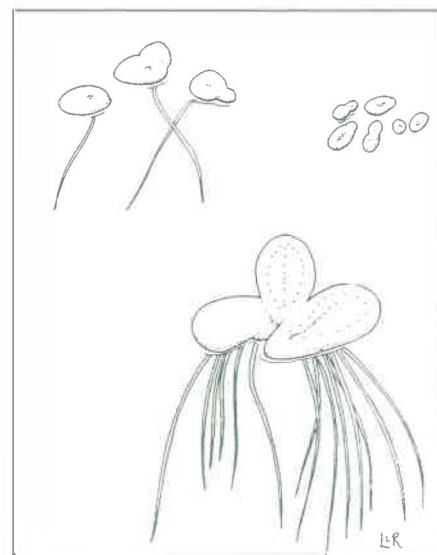
(*Wolffia spp.*)

As a group, watermeal has the distinction of being one of the world's smallest flowering plants. A member of the duckweed family, watermeal is a free-floating plant

that is hardly visible to the naked eye. It is rootless and floats with only its dorsal surface breaking the water surface. Normally growing in association with other duckweeds, it is capable of survival in damp vegetation found along the edges of ponds or sloughs.

Quite often, watermeal is misidentified as an algae or "pond-scum." It is greatly affected by wind action and can be driven toward one end of a pond (which could aid in mechanical control of the plants). On calm days, the plant can completely cover a pond's surface.

Commonly found in the tropics, three species of watermeal grow in the northern, central, and eastern United States. The plants can become a nuisance when the concentrations become dense, yet it is rare that these plants impede navigation or recreational fishing. As a wildlife food source, watermeal, like all duckweeds, is of tremendous value to waterfowl, gallinules, coots, and rails.



Floating Vegetation: Watermeal

IDENTIFICATION

Rarely does this floating plant exceed 1 mm in length, and it is almost as wide as it is long. In general the plant floats on, or just below, the surface. At times, however, it may be found as deep as a foot below the surface. The individual plants look

Credit: IFAS, University of Florida, Gainesville

like small round or partially spherical (flat on top and spherical on bottom) particles of ground grain. The leaves are light green and round or elliptical. Unlike many other duckweeds, watermeal does not have any roots. The tiny flowers, which are rarely produced, break through the upper leaf surface as a single perfect flower (male and female parts on the same flower), and only one seed is produced.

Although reproduction can occur by seeds, reproduction is principally by vegetative budding. Newly formed plants break away from the parent plant as they mature. The plants can lay dormant on rather dry soil along a pond shore and grow again once the pond fills with water.

CONTROL

Mechanical control of the duckweeds is a safe and moderately effective method of removing the nuisance plant from a pond. If the pond has an overflow drain or spillway that can be blocked off and there is adequate flow into the pond, close or block-off the drain, allow the water level to rise 6 to 10 inches in the pond, wait until the watermeal is wind-rowed at the drainage end of the pond, and pull the plug to allow the water level to recede to normal pool level. This will remove a good bit of the vegetation, and it is economically and environmentally sound since chemicals are not being used to control the populations.

When chemicals are used to control aquatic vegetation, certain pre-

cautions must be followed. Always read the label and follow the directions. It is best to spot treat areas where watermeal is first sighted. Determine the water uses and any use restrictions associated with the chemical control.

Obtain all necessary permits. Make sure you have properly identified the aquatic plant and have chosen the correct chemical control. Mix and apply the chemical according to the label directions. Keep the necessary records – they are required by law. Finally, monitor the water for dissolved oxygen and pH shifts after treatment to determine the effectiveness of the treatment and whether any fish kill occurs. Heavy plant die-off can cause oxygen depletion, while heavy growth can cause pH shifts on a daily cycle.

CHEMICAL CONTROL. The following is a table of chemicals labeled to treat water meal. The table was compiled from information gathered from the aquatic chemical industry. *Inclusion in the table does not imply endorsement by the University of Maryland nor by the authors.* Omission of chemicals is a result of oversight on the authors' part or of new label registration. The table is for comparison purposes only and is not intended to replace the chemical label. Labels are subject to change; therefore, always check the label for treatment sites, rates, and precautions before purchasing or applying any chemical. **Do not use the table for treating aquatic plant problems.**

Watermeal (<i>Wolffia</i> spp.)				
Chemical Name	Chemical Type	Application	Restriction	Comments
Weed RHAP A-4D	Dimethylamine salt	2.5-4.5 pt in 50-100 gal water/acre	do not use water for irrigation, domestic purposes, or fishing	vapors may harm nearby crops at temperatures above 95° F
Weedtrine D	Diquat dibromide	5 gal./acre	livestock watering, spraying, irrigation, drinking – 14 days	do not use in muddy water
Watrol	Diquat dibromide	24 gal in 30-130 gal water/acre	livestock watering, spraying, irrigation, or swimming – 14 days	do not use in muddy water

REFERENCES AND FURTHER READING

Aulbach-Smith, Cynthia A., Steven J. de Kozlowski, and Lawrence A. Dyck. 1990. Aquatic and wetland plants of South Carolina. South Carolina Aquatic Plant Management Council and South Carolina Water Resources Commission, Columbia.

Lorenzi, Harri J. and Larry S. Jeffery. 1987. Weeds of the United States and their control. An AVI Book, Van Nostrand, Reinhold Co., New York.

Radford, Albert E., Harry E. Ahles, and C. Ritchie Bell. 1968. Manual of the vascular flora of the Carolinas. The University of North Carolina Press, Chapel Hill.

Traver, David P., John A. Rodgers, Michael J. Mahler, and Robert L. Lazor. 1978. Aquatic and wetland plants of Florida. Special Publication, Florida Department of Natural Resources, Bureau of Aquatic Plant Research and Control. Tallahassee, Florida.

NOTE: Because of the ecological role and sensitivity of aquatic vegetation, as well as Baywide efforts to restore this important resource, the state does not permit the use of chemical control in tidal waters, and greatly restricts their use in nontidal, flowing waters. Acquaint yourself with all regulations governing plant control activities, and obtain all necessary permits. Non-chemical means should be utilized where practicable.

FOR FURTHER INFORMATION

For general information about the Maryland Sea Grant Extension Program, visit the web:

<http://www.mdsg.umd.edu/MDSG/Extension/index.html>

For technical questions, contact an extension agent or specialist at one of these locations:

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University of Maryland
Wye Research and Education Center
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Maryland Sea Grant Extension
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Chesapeake Biological Laboratory
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Maryland Sea Grant Extension
University of Maryland
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FOR ADDITIONAL COPIES

Copies of Maryland Sea Grant Extension workbooks on aquatic plants, including color photographs for use in identifying species, are available on the web at:

<http://www.mdsg.umd.edu/MDSG/Extension/Workbooks>

Additional copies of printed workbooks are available from the Maryland Sea Grant College Program, 0112 Skinner Hall, University of Maryland, College Park, MD 20742-7640.

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