



Aquatic Plant Identification and Management Workbook, Series 2

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 are intended as guidelines and must not replace directions on chemical labels. A list of fact sheets describing a variety of aquatic plants and their management is available from the Maryland Sea Grant Extension Program or your local Cooperative Extension Office.

SUBMERSED VEGETATION

Bladderwort

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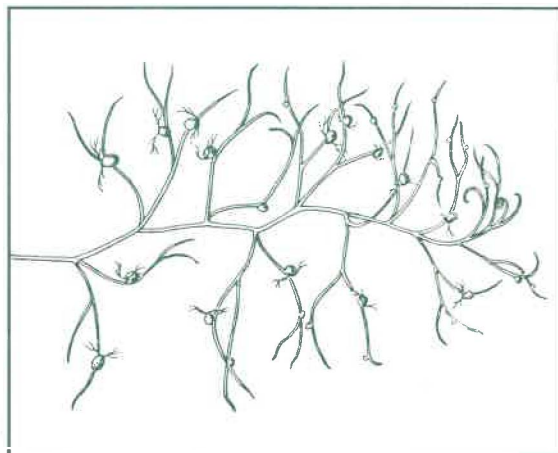
INTRODUCTION

Vascular flowering aquatic plants are seed-bearing 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 workbook series focuses on bladderwort, a submersed plant.

Submersed plants are underwater vegetation usually found in deeper waters. Completely submersed, they are usually rooted to the bottom, lack rigid cell structures (making them appear limp), and often grow up to the water surface. Flowers, when present, often extend above the water surface in spikes.

BLADDERWORT (*Utricularia* spp.)

Bladderwort is one of nature's more interesting plants. It has turned the tables on animals because this group of plants can be



Rebecca Haefner

Submersed Vegetation: Bladderwort

carnivorous, using small bladders or pouches that act as traps for insects, plankton, and even fish larvae. An animal enters the bladder through valvelike "doors" which close and trap it inside; eventually the animal is digested and contributes to the nitrogen metabolism of the plant.

The plant is most commonly found in acid or soft waters with a mucky or sandy bottom. Though some species can form mats in shallow water which may hinder movement of fish and boats, it is rarely a problem in commercial or sport fish ponds. Bladderwort is

CHEMICAL CONTROL. The following is a table of chemicals labeled to treat bladderwort. 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. Do not use the table for treating aquatic plant problems.

Bladderwort				
Chemical Name	Chemical Type	Application	Restriction Periods	Comments
Ultimate	Diquat dibromide	10-20 gal/acre	livestock watering, swimming, spraying, irrigation-14 days drinking-24 days	do not apply to muddy water
Weedtrine II	2, Ethylhexyl Ester 2,4-D	100-150 lb/acre	do not use for irrigation or domestic purposes	vapors can damage nearby crops
Aqua-Kleen (partial control)	2,4-D	150-200 lb/acre	do not use for irrigation, spraying, livestock, or domestic purposes	
Weedtrine-D	Diquat dibromide	5-10 gal/acre	livestock watering, spraying, irrigation, drinking-14 days	do not apply to muddy water
Aquaquat	Diquat dibromide	1/4-1/2 ppm cation	livestock watering, spraying, irrigation, drinking-14 days	do not apply to muddy water
Sentry	Diquat dibromide	Depth 1 ft 7-14 gal 3 ft 21-42 gal 5 ft 35-70 gal	livestock watering, spraying, irrigation, drinking-14 days	do not apply to muddy water
Watrol	Diquat dibromide	48 gal/acre	livestock watering, spraying, irrigation, drinking-14 days	do not apply to muddy water
Norkem 500	Diquat dibromide	40 gal/acre	livestock watering, spraying, irrigation, drinking - 14 days	do not apply to muddy water
Diquat Herbicide-H/A	Diquat dibromide	1-2 gal/acre	livestock watering, spraying, irrigation, drinking – 14 days	do not apply to muddy water
912 Aquatic Weed Killer	Diquat dibromide	10-20 gal/acre	livestock watering, swimming, irrigation, spraying – 10 days drinking – 14 days	do not apply to muddy water
Sonar A.S.	Fluridone	Depth <3 ft 0.5-0.75 qt/acre 3-5 ft 0.75-1.0 qt/acre > 5 ft 1.0-1.5 qt/acre	irrigate established tree crops- 7 days/new crops and turf- 30 days	do not use in tidewater or brackish water, do not use where crayfish are farmed
Sonar 5P	Fluridone	Depth < 3 ft 10-15 lb/acre 3-5 ft 15-20 lb/acre > 5 ft 20-30 lb/acre	irrigate established tree crops- 7 days/new crops and turf- 30 days	do not use in tidewater or brackish water, do not use where crayfish are farmed
Sonar SRP	Fluridone	Depth < 3 ft 10-15 lb/acre 3-5 ft 15-20 lb/acre > 5 ft 20-30 lb/acre	irrigate established tree crops- 7 days/new crops and turf- 30 days	do not use in tidewater or brackish water, do not use where crayfish are farmed

generally considered of little use to wildlife other than providing cover for small insects and fish.

IDENTIFICATION

Bladderwort is usually found free-floating. It can be green to purplish in color. The bladders which trap the insects start out green, then turn purple to black as the insect remains collect in them. The plant has two types of leaves, submersed and floating. The submersed leaves are alternate and filiform (thread-shaped), and are the leaves that have the bladders. The floating leaves are divided along a common axis in whorls of 4 to 10. The floating leaves also have inflated petioles. Rarely, if ever, are there roots, but the plant can be anchored to the bottom of a pond or ditch.

Reproduction of the plant is by seeds or fragmentation. The flowers (1 to 12), which appear from May through early fall, are found at the end of a scape (a naked flowering stem rising from the ground without proper leaves) between 2 and 5 inches tall. The flowers can be yellow to purple or violet and have a spur associated with them. Yellow is the more common flower color. The fruit is a capsule.

CONTROL

When chemicals are used to control aquatic vegetation, certain precautions must be followed. Always read the label and follow the directions. It is best to spot treat areas where the bladderwort is first sighted instead of waiting until it takes over a pond completely. Determine the water uses and any use restrictions associated with the chemical control. Obtain all of the necessary permits. Make sure that 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 — it is 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 kills occur. Heavy plant die-off can cause oxygen depletion, while heavy growth can cause pH shifts on a daily cycle.

REFERENCES AND FURTHER READING

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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.

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ACKNOWLEDGEMENTS

This fact sheet was funded in part by the University of Maryland Cooperative Extension Service, the Center for Environmental and Estuarine Studies, and through grant NA90AA-D-SG063 awarded by the National Oceanic and Atmospheric Administration to the University of Maryland Sea Grant College Program.

Publication Number
UM-SG-MAP-92-04

Copies of this Sea Grant Extension publication are available from: Sea Grant College, University of Maryland, 0112 Skinner Hall, College Park, MD 20742.

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Issued in furtherance of Cooperative extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, University of Maryland, and local governments. Craig S. Oliver, Director of Cooperative Extension Service, University of Maryland System.

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