



## Aquatic Plant Identification and Management Workbook, Series 1

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 separate fact sheet, in color, displays each of the aquatic plants in this series and is available from the Maryland Sea Grant Extension Program or your local Cooperative Extension Office.

### F L O A T I N G   V E G E T A T I O N

# American Lotus Water Lily

Reginal M. Harrell and John N. Hochheimer  
*Maryland Sea Grant Extension Program*

**V**ascular 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, submergent, emergent and terrestrial. Floating vegetation includes plants that are unrooted 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.

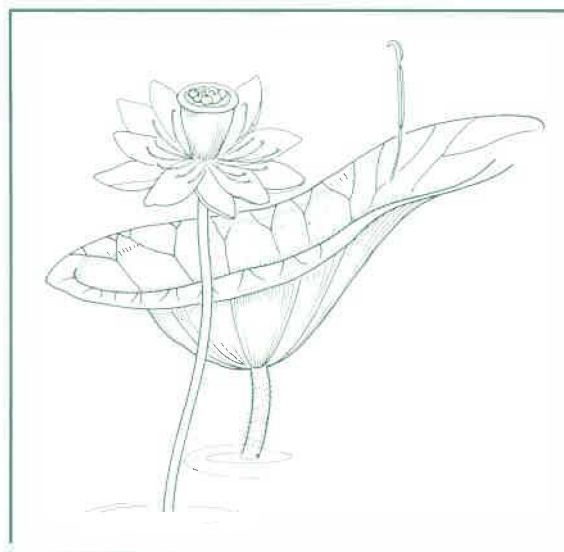
## AMERICAN LOTUS WATER LILY (or WATER CHINQUEPIN)

American lotus (*Nelumbo lutea*) is an attractive plant that has, in addition to a beautiful yellow flower, seed pods commonly used in floral arrangements. However, like most water lilies, the plant tends to grow so densely that the leaves can cover a pond's entire surface, making recreational use difficult. The plant does have some slight value as a wildlife food source: wood ducks and mallards

eat the large seeds, and muskrats and beavers feed on the leaves, which also provide shade and shelter for small fish and invertebrates. However, water lilies also create an ideal habitat for mosquito larvae. The seeds and tubers are frequently eaten by man, either green or cooked, and have a taste similar to chestnuts.

### IDENTIFICATION

There are several types of water lilies, all of which are rooted perennials with floating waxy leaves; they are usually found in muddy, shallow, stagnant or slow-moving waters. American lotus can be distinguished from other water lilies by its large circular leaves which, unlike white water lilies, are not split in the middle. It does have a centrally attached leaf stem (petiole) with numerous veins radiating out from the center. Early in the growing season, the leaves (up to 23 inches in diameter) float



*Floating Vegetation: American Lotus Water Lily.*

Karen Teramura

on the surface. However, as the petiole grows, the leaves can extend over three feet into the air; the center of the leaf will become depressed and form a large bowl. The leaves are dark bluish green.

American lotus has solitary pale yellow flowers which are five to ten inches broad. The flower, arising from a long stalk (peduncle), is comprised of 20 or more sepals and petals, and is present from July through September. The seeds are

**CHEMICAL CONTROL.** The following is a table of chemicals labeled to treat water lilies. 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.**

<b>American Lotus Water Lily</b>				
<b>Chemical Name</b>	<b>Chemical Type</b>	<b>Application</b>	<b>Restriction Periods</b>	<b>Comments</b>
Sonar A.S. (partial control)	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, near crops and turf--30 days	do not use in tidewater or brackish water
Sonar 5P (partial control)	Fluridone	depth <3 ft 10-15 qt/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 (partial control)	Fluridone	depth <3 ft 10-15 qt/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
Weed RHAP LV-4D	Isooctyl ester 2,4-D	2.5-4.5 pt in 50-100 gal water/acre	do not use water for irrigation or domestic purposes	when temperatures are above 95° F, vapors may damage nearby crops
Weed RHAP LV-6D	Isooctyl ester 2,4-D	1 2/3-3 pt in 50-100 gal water/acre	do not use water for irrigation or domestic purposes	when temperatures are above 95° F, vapors may damage nearby crops
Weed RHAP A-4D	Dimethylamine Salt 2,4-D	1 2/3-3 pt in 50-100 gal water/acre	do not use water for irrigation or domestic purposes	when temperatures are above 95° F, vapors may damage nearby crops
Aqua-Kleen (Slightly resistant)	2,4-D	150-200 lb/acre	do not use water for irrigation or livestock	
Weedtrine II	Ethylhexl ester 2,4-D	100-150 lb/acre	do not use irrigation or domestic purposes	vapors can damage nearby crops
Rodeo	Isopropylamine	apply with surfactant at the at the rate of 0.25-0.5% by volume		do not apply in estuaries

acorn-shaped and about half an inch in diameter. Reproduction, usually occurring during winter dormancy, is either by seeds or by vegetative branching from rootstock rhizomes, which are tuber-forming.

### 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 American lotus water lilies are first sighted instead of waiting until they take 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—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.

### REFERENCES AND FURTHER READING

Prescott, G.W. 1969. How to know the aquatic plants. William C. Brown Company, Publishers, Dubuque, Iowa.

Hotchkiss, Neil. 1972. Common marsh, underwater and floating-leaved plants. Dover Publications, Inc. New York.

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

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.

Wellborn, Thomas L. 1985. Aquatic weed identification and control: Duckweed. Information Sheet Number 1033, Extension Service, Mississippi State University, Mississippi State, Mississippi.

**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

Maryland Sea Grant Extension  
University of Maryland Cooperative  
Extension Service  
Talbot County Office  
P.O. Box 519  
Easton, Maryland 21601  
Telephone: (301) 822-1166

Maryland Sea Grant Extension  
University of Maryland  
Horn Point Environmental Lab  
P.O. Box 775  
Cambridge, Maryland 21613  
Telephone: (301) 228-8200

Maryland Sea Grant Extension  
University of Maryland  
Cooperative Extension Service  
Harford County  
2335 Rock Spring Road  
Forest Hill, Maryland 21050  
Telephone: (301) 838-6000

Maryland Sea Grant Extension  
University of Maryland  
Cooperative Extension Service  
St. Mary's County  
P.O. Box 663  
Leonardtown, Maryland 20650  
Telephone: (301) 475-4485

### ACKNOWLEDGEMENTS

This fact sheet was funded in part by a grant from the United States Department of Agriculture under the Renewable Resources Extension Act to the University of Maryland Cooperative Extension Service. Additional funding was provided by the University of Maryland Center for Environmental and Estuarine Studies and through grant NA86AA-D-SG-006, awarded by the National Oceanic and Atmospheric Administration to the University of Maryland Sea Grant College Program.

Publication Number  
UM-SG-MAP-89-07

Copies of this Maryland Sea Grant Extension publication are available from: Sea Grant College, University of Maryland, 1224 H.J. Patterson Hall, College Park, MD 20742

Line drawing © 1989 Karen Teramura. All rights reserved. This illustration is reprinted from *Chesapeake Bay, Nature of the Estuary: A Field Guide* by Christopher P. White with illustrations by Karen Teramura, published by Cornell Maritime Press, Inc., \$12.95.



The University of Maryland System is an equal opportunity system. The system's policies, programs and activities are in conformance with pertinent Federal and state laws and regulations on nondiscrimination regarding race, color, religion, age, national origin, sex and handicap. Inquiries regarding compliance with Title VI of the Civil Rights Act of 1964, as amended; Title IX of the Educational Amendments; Section 504 of the Rehabilitation Act of 1973; or related legal requirements should be directed to the Director of Personnel/Human Relations, Office of the Vice Chancellor for Agriculture and Natural Resources, Symons Hall, College Park, MD 20742.