COOPERATIVE EXTENSION SERVICE
University of Maryland System • Maryland Sea Grant Extension Program

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.

A L G A E

Filamentous Algae

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Filamentous algae are one of several kinds of algae that occur in Maryland's fresh and brackish water ponds. While some algae can be beneficial, often serving as a primary or secondary food supply for fish, even these can become too plentiful. Filamentous algae are usually very troublesome in a pond, forming extensive mats of long strands of plant material that can trap fish. They can give a pond an offensive odor or even cause off-flavor in fish. Often completely covering a pond, they can cause severe oxygen depletion and sometimes pH problems.

FILAMENTOUS ALGAE

Many species of filamentous algae are found throughout Maryland in both fresh and brackish water. The genus most common to the freshwaters is *Hydrodictyon*, while the most common nuisance filamentous algae found in brackish water is *Entermorpha*. Better known as waternet, *Hydrodictyon* is a filamentous type which resembles a net with five- to six-sided cell meshes—these nets are generally in the form of a flat sheet, although in some species they can form a cylindrical pouch. Waternet grows well in small ponds and in swamps; it occurs for the most part in hard water systems and is associated with high pH. Populations can become so dense as to interfere with fishing and swimming. Dense populations can cause oxygen depletion and give rise to offensive odor.

Probably the most noxious type of filamentous algae found in freshwater ponds is *Pithophora*. It is irregularly branched and made up of long cylindrical cells. The branches tend to diverge from the main axis at right angles and either remain solitary or branch once or twice. Initially growing as attached algae, these plants eventually become so dense that gases form and cause the mats to float. This floating mass can best be described as wet wool. *Pithophora* is commonly found in small ponds or slow-moving streams. Like waternet, *Pithophora* can interfere with sport fishing and swimming, deplete oxygen and provide a breeding haven for mosquitoes.

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 filamentous algae 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.

CHEMICAL CONTROL. The following is a table of chemicals labeled to treat filamentous algae. 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.**

Filamentous Algae

Chemical Name	Chemical Type	Application	Restriction Periods	Comments
Mogul Ag-431	Elemental Copper 7.1%	0.75 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° F, if alkalinity is <50 ppm, toxic to fish
A&U-70 Plus	Elemental Copper 8.0%	0.625 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° F if alkalinity is <50 ppm, toxic to fish
K-TEA	Elemental Copper 8.0%	0.68-1.70 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° F, if alkalinity <50 ppm, toxic to fish
Cutrine-Plus	Elemental Copper 9.0%	0.6 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° F alkalinity <50 ppm, toxic to fish
Aquatrine	Elemental Copper	0.6 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° F, if alkalinity <50 ppm, toxic to fish
Copper Control	Elemental Copper 8.5%	0.65-1.6 gal/acre-ft dilute w/ 10-20 parts water for application	none	apply on sunny day, water temperature >60° degrees, if alkalinity <50 ppm, toxic to fish
Copper Sulfate Monterey	Copper Sulfate Penthydrate	3-6 lb/acre-ft	none	if alkalinity <50 ppm, toixc to fish
Copper Sulfate Agway	Copper Sulfate Penthydrate	2.75-5.5 lb/acre-ft	none	if alkalinity <50 ppm, toxic to fish
Kocide	Copper Sulfate Penthydrate	1.3-5.32 lb/acre-ft	none	if alkalinity <50 ppm, toxic to fish
Solricin 135	Potassium Ricinoleate	1.9-9.5 gal/acre-ft, depends on density of bloom	3-14 days harvest, irrigation, live-stock watering—14 days	selective for blue green algae only
Weed Boomer	Diquat 10.5%	2.7-8.1 gal/acre-ft	livestock, fishing, swimming, irrigation—10 days, human consumption—14 days	do not use in muddy water, will kill vascular plants
Weedtrine	Diquat 8.53%	3.4-10.1 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—14 days	do not use in muddy water, will kill vascular plants
Aquaquat	Diquat 8.54%	3.4-10.1 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—14 days	do not use in muddy water, will kill vascular plants
Yardman	Diquat 1.85%	14-42 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—14 days	do not use in muddy water, will kill vascular plants
912 Aquatic	Diquat 4.35%	6.8-20.2 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—14 days	do not use in muddy water, will kill vascular plants
Norkem 500	Diquat 2.16%	14-42 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—14 days	do not use in muddy water, will kill vascular plants

Chemical Name	Chemical Type	Application	Restriction Periods	Comments
Ultimate	Diquat 4.35%	6.8-20.2 gal/acre-ft	livestock, fishing, swimming, irrigation, human consumption—24 days	do not use in muddy water, will kill vascular plants
Ortho Diquat	Diquat 35.3%	0.68-2.03 gal/acre-ft	livestock, fishing, swimming, irrigation—14 days	do not use in muddy water, will kill vascular plants
Aquashade	Blue & Yellow Dye	0.25 gal/acre-ft	not for human consumption	less effective within 2 feet of surface
Aquazine	Simazine	1.75-4.25 lb/acre-ft	swimming - 4 hours, irrigation, livestock human consumption—12 mos.	non-selective systemic herbicide
Hydrothol 191 Liquid	Endothol 53.0%	0.6-2.2 pts/acre-ft	fish harvest —3 days all others, up to 25 days	fish toxicity 0.3 ppm
Hydrothol 191 Granular	Endothol 11.2%	3-11 lbs/acre-ft,light 27-82 lbs/acre ft,heavy	fish harvest —3 days, all others, up to 25 days	fish toxicity 0.3 ppm

REFERENCES AND FURTHER READING

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

Traver, David P., John A. Rodgers, Michael J. Mahler and Robert L. Lazor. 1978. Aquatic and wetland plants of Florida. Special Publication of 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

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