WEED CONTROL FOR WORKING PONDS: GUARDING FUNCTION AND APPEARANCE

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Ponds play an important role in the functioning of many modern facilities. They serve a variety of uses including cooling of industrial machinery, reservoirs for fire protection, treatment of wastes, and/or retention of storm water.

Consequently, the management of these ponds can be an important consideration in maintaining production, protecting costly equipment, lowering fire insurance rates, complying with effluent standards, or preventing floods. Frequently these ponds serve multiple purposes and must be managed accordingly.

Since many of these water bodies are located adjacent to the plant, their appearance can reflect the environmental consciousness of the company. Visiting customers and the surrounding community often obtain their first impression of an industrial facility based upon its external appearance.

Plant managers or industrial engineers are often the ones responsible for the upkeep and maintenance of these ponds. Unfortunately, many of the problems which confront them are of a biological nature, an area outside their training and expertise. While familiar with the mechanics such as flow rates, pump capacities, retention times, etc., when faced with nuisance aquatic weed and algae growth they are at a loss for solutions.

The very nature and uses of many industrial waters increase their potential for having nuisance vegetation problems. Cooling ponds often maintain relatively high water temperatures (60°F-90°F) year round. Aquatic plants, like terrestrial vegetation, respond to these warmer temperatures by growing faster and more persistently throughout the year.

Storm water retention ponds fed by runoff, sewage treatment lagoons, and ponds located in fertilized, landscaped areas receive high levels of nutrients (nitrogen and phosphorus) which enhance aquatic growth. Both warm water and high nutrient concentrations contribute to aquatic vegetation problems.

Mechanical rather than chemical solutions are often sought since most engineers are more

Practical functions of ponds include irrigation and drainage retention as in the case of this pond. These functions require extra management attention.

Herbicides for Pond Weed Management

Trade Name	Target Weeds	Precautions	Manufacturer
Algimycin (chelated copper)	Algae	Use when water is above 60 degrees F.	Great Lakes Biochemical
Amitrole	Waterhyacinth, cattails	Not for irrigation or drinking water.	Union Carbide
Aqua-Kleen (2,4-D)	Bladderwort, coontail, waterchestnut, watermilfoil, waterstargrass, waterlilly.	Not for irrigation or drinking water.	Union Carbide
Aquashade	Algae, submersed weeds, brittle naiad, pondweed.	Apply late winter, early spring.	Aquashade
Aquathol	Bassweed, coontail, watermilfoil, naiad, pondweed.	Not for irrigation within 7 days.	Pennwalt
Aquazine	Algae and many weeds.	See label.	Ciba Geigy
Banvel-720	Waterhyacinth, alligatorweed, arrowhead, water pennywort, smartweed, cattail.	Some state labels, only.	Velsicol Chemical Corp.
Casoron G-10	Elodea, naiad, watermilfoil, coontail, pondweeds.	Not for irrigation or drinking water. Preemergence.	Thompson-Hayward
Cutrine-Plus	Algae, Chara.	With granular treat pond in portions.	Applied Biochemists
Diquat	Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, pennywort, duckweed.	Ten day wait needed before pond can be used for swimming, irrigation, drinking.	Ortho Div., Chevron
Hydrothol	Algae, Chara.	Fourteen day wait for irrigation or domestic uses. Treat only portions of pond at one time.	Pennwalt
K-Lox	Hydrilla, algae.	Apply on sunny day for actively growing hydrilla.	Sandoz
Vegatrol LV 4-D	Watermilfoil, water lilies, coontail.	Not for irrigation ponds.	Velsicol Chemical Corp.
Weedtrine II	Selected submerged and emergent plants.	Not for irrigation ponds.	Applied Biochemists

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Aquashade Inc., PO Box 198, Eldred, NY 12732. 914-557-8077.
Ciba Geigy Corp., PO Box 11422, Greensboro, NC 27409. 919-292-7100.
Great Lakes Biochemical, 6120 W. Douglas Ave., Milwaukee, WI 53218. 414-464-1200.
Ortho Div., Chevron, 575 Market St., San Francisco, CA 94105. 415-894-3760.
Pennwalt Corp., 1630 E. Shaw, Fresno, CA 93710. 209-226-8400.
Sandoz Inc., 480 Camino Del Rio, San Diego, CA 92108.
Thompson-Hayward, 5200 Speaker Rd., Kansas City, KS 66110.
Union Carbide, 7825 Bay Meadows Way, Jacksonville, FL 32216.
Velsicol Chemical Corp., 341 E. Ohio St., Chicago, IL 60611.

familiar with equipment. Screens, filters or aerators are installed in an attempt to solve problems. When chemicals are used, they are frequently of the wrong type. Biocides containing quaternary ammonium chloride compounds, chlorine, and copper sulfate are initially introduced due to their availability and the engineer's familiarity with them. Understandably, results are often poor. These chemicals are not specifically designed to control the plants present and they might not be compatible with the water quality in the pond.

It is important to note that there are specific aquatic herbicides and algaecides which are registered with the Federal Environmental Protection Agency for use in ponds.

The combination of algaecides and herbicides applied as a tank mix have shown promise through enhanced effectiveness. Specific recommendations on tank mix uses are available from manufacturers.

Several considerations must go into planning and implementing an aquatic nuisance control program. Before purchasing and applying anything, it is first necessary to identify the problem plants. State natural resource agents, university biologists, or Soil Conservation Service agents can usually be called upon for this.

Water volume or surface area and depth must be determined to calculate the amount of material required. Generally, aquatic chemical application rates are given in terms of gallons or pounds per surface acre (43,560 square feet) or acre-foot (326,000 gallons). Sometimes, parts per million (ppm) recommendations are given. One ppm is equivalent to 2.73 pounds of material in one acre-foot of water.

Flow, evaporation, or dilution with make-up water can affect results if they are not compensated for in the application. It is necessary that sufficient contact time between toxic concentrations of the herbicide and target plants be maintained for several hours. Granular formulations

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or metering (drip) systems are sometimes used in flowing water situations or to treat make-up water which is entering the pond. Recirculating pumps can sometimes be shut down during treatment and kept off for several hours. Ponds fed by significant amounts of runoff should not be treated when heavy rains threaten.

While most aquatic pesticides are compatible with a wide range of water qualities, certain conditions can neutralize them. Some herbicides should not be used in muddy waters since the active ingredient becomes deactivated (i.e. Diquat). Similarly, copper sulfate applied for algae control in hard water precipitates out of solution too quickly to be effective. Chelated copper may be used to insure proper contact time.

Corrosion can be of some concern, particularly when the pond water is recirculated through or around expensive equipment. Generally, chemical concentrations after application are too low to cause any problems. High dosage of copper sulfate or poor distribution of products, however, could cause damage.

Effluent standards, particularly in sewage treatment or retention ponds, must be met if they flow into nearby waterways. Familiarity with state guidelines and permits is of utmost importance. For example, the suspended solids content might exceed state requirements due to abundance of planktonic algae. A remedial action would be to apply a copper algaecide. It must be insured, however, that the copper concentration does not exceed effluent standards for copper.

Equipment used for applying aquatic pesticides will vary depending upon the size of the area to be treated and the formulation being used. Granular materials are often spread with a hand scoop or mechanical spreader. Power sprayers with 1 to 5-hp engines are useful in areas exceeding one acre. Hand or backpack orchard sprayers facilitate treatment of small water bodies. Metering in of chemical with drip systems is effective where compensation for water flow or exchange must be considered.

Frequency of chemical application will vary with each situation. In temperate climates, a single herbicide treatment followed by two or three algaecide applications will keep vegetation under control during the warmer months. In warmer regions, more frequent applications might be necessary. Chemicals are best applied before growth gets out of hand and when water temperatures are above 60°F. Periodic examination of the pond will help in developing the proper maintenance schedule.

Regardless of the product being used, the applicator should familiarize himself with the label to insure proper handling, application, and dosage of the material. Knowledge of applicable state laws, permits, and licensing should be obtained and complied with as well. **WTT**