Aquatic Weed Control

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Worldwide demands are being placed upon freshwater supplies as a prerequisite to expanding real estate, industrial and agricultural development. Economic growth in these areas is dependent upon water of suitable quality and quantity for drinking, household use, irrigation, stock watering, hydro-electric power generation, industrial cooling, transportation, waste disposal, and aquaculture. After basic demands are met for subsistence and economic development, interest in water resources for recreation and leisure becomes increasingly important. Fishing, swimming and boating facilities can lead to the development of a recreational industry.

Multiple use of limited water supplies requires planning, cooperation between users, and management. As a common resource utilized for diverse purposes, water supplies are readily subject to degradation. A major threat is the increasing fertility of water resulting from nutrients entering by way of agricultural runoff and wastewater discharge. These fertile waters support luxuriant growths of aquatic vegetation, which interfere with intended uses. Thus, aquatic weed and algae growth can actually threaten the livelihood and future economic development of an area.

Prevention of this growth by limiting nutrient sources is not technologically feasible in most situations. While in some areas, farming methods and wastewater treatment systems have been upgraded, waters with existing high nutrient levels will be slow to recover. Engineering designs of water conveyance systems, dams, and impoundments can also serve to avoid some future aquatic vegetation problems, however, costs and deadlines may prohibit the incorporation of these innovative measures.

Four general approaches have been used to control aquatic vegetation problems. They are: Mechanical, Biological, Habitat Manipulation, and Chemical. At times, a combination of these methods into an integrated pest management scheme has proven useful. Each approach has its advantages and disadvantages.

Mechanical control involves cutting and removal of the vegetation from the waterway. Various dredges, cutters, and conveying equipment have been developed for this task. In some areas, certain harvested aquatic vegetation has been put to use as mulch or animal feed. However, as can be expected, mechanical removal is a cumbersome task requiring expensive, slow-moving equipment, high maintenance costs, and considerable energy expenditures. Re-growth may occur rapidly and such equipment is not adaptable to all types of waterway systems.

Biological control involves the introduction of natural control agents such as herbivorous fish, insects, or plant pathogens, which feed or host upon nuisance vegetation. While some advancements have been made in this approach, potential environmental ramifications from these introductions are still unknown. Disruptions of food chains and habitat of desirable native fish and aquatic organisms could result.

Habitat manipulation is a technique in which a physical change is made in the local environmental conditions which will kill or prevent aquatic vegetation growth. Examples include drawdown, dilution, fertilization and aeration. Each of these has limited application and may serve to change only the species of nuisance vegetation present.

Chemical control is by far the most widespread, economical and effective approach used in the management of aquatic plants. Most chemicals approved for use in water have been thoroughly screened and tested by industry, government, and research institutions to ensure their safety. They are applicable to many types of use sites, and with suitable application pumps and spreaders, can be applied efficiently and effectively.

Applied Biochemists, a division of Laporte Water Technologies, Inc., produces a number of products exclusively designed for aquatic vegetation control. Their Cutrine Plus algaecide, a chelated copper algaecide in both liquid and granular formulations, is just one example how recent technology has improved upon old knowledge. Copper used in the form of copper sulfate, has been used for many years in mass quantities for algae control. Problems were encountered with the rapid loss of copper from solution due to precipitation in hard water. Limited effectiveness, environmental concerns over copper build-up in sediments, and the need for high dosages have been the result. Cutrine Plus overcomes this problem by providing copper in a chelated form, which is non-reactive with other chemical constituents in the water.

Various herbicides are also avail-able in liquid and granular formulations. These can be used for selective weed control of specific species or in designated areas without environmental disruption. The ability to tank mix Cutrine-Plus with various aquatic herbicides provides additional versatility and effectiveness when dealing with mixed vegetation populations.

Advanced technology in application equipment and techniques has improved the effectiveness and versatility of chemical control. Use of inverting systems, a method by which chemicals are surrounded by oil droplets, improves the contact time between chemicals and submerged aquatic plants. This also reduces chemical requirements. Similar success has been achieved by incorporating special polymers into spray mixtures. Drip systems offer a means by which herbicides and algaecides can be efficiently metered into flowing water systems. Various spray pump system designs mounted on barges or airboats provide a useful approach to treatment of lakes, reservoirs, and larger drainage canal systems.

International concern over aquatic vegetation control has resulted in cooperative efforts being made between weed scientists, governments, and industry. The 6th International Symposium on Aquatic Weeds held in September 1982, in Yugoslavia addressed the worldwide scope of these problems. U.S. firms, such as Applied Biochemists, (AB) have also taken a keen interest in foreign aquatic vegetation control projects. AB has already developed distribution and provided technical assistance for its aquatic plant control products in several Far Eastern countries through its international company. Future demands placed on water in developing countries are expected to increase the need for these quality aquatic herbicides and algaecides.