Experience With Eurasian Watermilfoil At Edgewood Arsenal, Maryland

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INTRODUCTION

The 32 installations which comprise the US Army Munitions Command (MUCOM) cover approximately 273,000 acres. In addition to salt water front property, we have countless fresh water ponds and lakes totally or partially contained within the boundaries of our plants, not to mention considerable river frontage.

As the result of extensive manufacturing activities of this command, our pollution problems account for about 80% of the total pollution problems of the US Army. The percentage cited is based on dollar value for abatement, not upon total pollution emissions.

While we are not pleased with this record, I am pleased to report that we at MUCOM have made significant progress in resolving the problems of pollution through an active pollution abatement program. All pollution situations have been identified, and projects submitted to appreciably reduce or eliminate this pollution. This was not only our choice but was also the result of specific executive direction from Ex-President Lyndon Johnson and our present Chief, Richard Nixon. The dollar value of abatement measures and equipment for MUCOM's existing plants and works amounts to approximately 106 million dollars, a figure we consider to be significant, if not impressive. We are also modernizing many of our facilities. Pollution abatement funds going into this work will amount to an additional 400 million dollars. These sizeable expenditures assure that pollution abatement will be a reality by fiscal year 1974 and 1985, respectively, providing Congress authorizes these funds. Some of the projects have already been funded, and some of the work has already been completed.

PLANS FOR POLLUTION CONTROL

Our present plans extend beyond mere pollution control. We are now involved in a plan of total environmental protection which embraces consideration of ecological balances and land and noise pollution as well as the more familiar air and water pollution abatement efforts.

I make these statements because I want to emphasize that we at the federal level recognize our problems and obligations and are pursuing this program as a number one priority effort.

Going into my specific subject, I would like to relate our experience with Eurasian watermilfoil (*Myriophyllum spicatum* L.) at Edgewood Arsenal. The Arsenal, which is one of our 32 installations, is located north of Baltimore on the Chesapeake Bay and has had its share of problems because of aquatic weeds. While we feel the treatment at Edgewood took care of the problem, the chemicals utilized are most certainly not the ultimate solution.

PROBLEMS WITH EURASIAN WATERMILFOIL

Invasion of the upper Chesapeake Bay region by Eurasian watermilfoil became apparent in 1954 when the plant was discovered in the Gunpowder River near Edgewood Arsenal. A survey conducted by Arsenal personnel in 1960 indicated only small areas contained Eurasian watermilfoil at that time. Surveys conducted during 1961-62 indicated the plant had spread and was infesting most of the water surrounding the installation. The dense growth and rapid spreading characteristic of this plant hampers normal water activity in some areas and completely eliminates it in others. If left uncontrolled, this plant contributes to excellent mosquito habitat, curtails boating and fishing, and destroys the natural waterfowl foods.

TREATMENT OF PROBLEM AREAS

The cost to treat all areas adjacent to the installation would be prohibitive ($100,000 to $500,000) as well as a waste of time unless complete control of all adjacent areas were made to prevent spread. Control measures taken by Edgewood Arsenal have been limited to small areas for the improvement of boating and water sports. The first control was performed in 1962 when 15 acres were treated with (2,4-dichlorophenoxy) acetic acid (2,4-D) impregnated in attaclay granules. Additional treatments were made with 2,4-D during 1967 (5 acres), 1968 (2 acres), and 1969 (1 acre). These were all made using granulated 2,4-D with 20% acid equivalent (a.c.) applied at the rate of 20 lbs a.c. per acre. Treatments were made during the period 1 May to 15 June before the plants had flowered. Results obtained were very good with complete kill in the areas treated. Very little kill was noted in adjacent areas. Areas treated remained free of plants for approximately 2 years.

During 1968, approximately 100 square yards in Lauderick Creek were treated with 6,7-dihydrodipyrido (1,2-a:2′1′-c)pyrazidiinium dibromide (diquat) at the rate of 2 lbs cation per acre. This treatment was very effective in removing Eurasian watermilfoil from the boating channels in the area. Eurasian watermilfoil as far as 1.0 mile away was also killed and some shore plants were eliminated for a year. However, no complaints were made by the public.

The State of Maryland requires that permits be issued for the applications of toxic materials to waters of the state for aquatic plant control. Such permits were obtained for the application of 2,4-D during 1967, 1968, and 1969. The state became aware of the application of diquat during 1968 after a visit to the installation in 1969. The installation was informed by the state that a permit was required for this type of work and requested that in the future, applications for permits be made.

SUMMARY

Currently there is no problem with Eurasian watermilfoil in the Bush River on the eastern side of the Edgewood Arsenal installation. There still is considerable Eurasion watermilfoil infestations in the Gunpowder River on the western side of this installation. There is speculation that a disease organism has eliminated the Eurasian watermilfoil from the Susquehanna Flats and the Bush River; however, it is not known if this has been confirmed. Since there is no longer a problem in the Bush River and this aquatic plant in the Gunpowder River appears to be contained and not spreading, no recent control measures have been taken. The installation has also been reluctant to enter into discussions with the state relative to who has jurisdiction over water areas within the installation boundaries and the necessity for obtaining permits for treating these waters.

In noxious aquatic weed control, our objectives and those of this society are most certainly the same. We extend to you the offer of complete cooperation in future endeavors.

Control Of Watermilfoil In Large Wisconsin Lakes[1]

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ABSTRACT

Studies conducted in Dane and Marinette Counties indicate that mechanical harvesting offers the most attractive means for large scale control of watermilfoil (*Myriophyllum* spp.). in Wisconsin lakes.

These studies examined chemical control, biological control, and habitat alteration as possible alternatives to mechanical harvesting. The reasons for the attractiveness of mechanical harvesting include the facts that this method is target specific, removes problem biomass from the ecosystem, leaves root systems intact, can actually improve fishing if planned intelligently, and is attractive from a political point of view. Estimates based on information supplied by the Wisconsin Department of Natural Resources and observations of the Dane County harvesting operation during the summer of 1970 place mechanical harvesting at one-half to one-third less than the least expensive acceptable chemical alternative, provided at least 200 acres of problem plant growth are involved. Updated estimates on rates of harvesting, and costs of harvesting, labor and maintenance suggest that these original calculations may have been too high. Some operational problems encountered in carrying out mechanical control of aquatic plants are discussed. Despite the attractiveness of mechanical harvesting, on a long term basis only enlightened shoreland management will solve the problem of watermilfoil in Wisconsin.

INTRODUCTION

Among the symptoms of accelerated eutrophication perhaps the most obvious is the proliferation of aquatic macrophytes. In our studies, Eurasian watermilfoil (*Myriophyllum spicatum* L.) and the variable watermilfoil (*M. heterophyllum* Michx.) have been identified as particularly offensive nuisances. These plants, which thrive in fine-grained sediments and muck bottoms in 1 to 4 m of water, are extremely aggressive competitors, capable of crowding out more desirable plant species and of growing as monocultures (16). Although there are differences in the ecological requirements and the life histories of the two species, both reproduce rapidly by means of four-seeded fruits and fragmentation. Variable watermilfoil also appears to be capable of producing winter buds, or turions, in the late fall (4). Both plants reach densities in excess of 3 kg/m^2 (wet weight). This dense growth provides excessive shelter for small fish which leads to stunting of larger predator species. Thick growth interferes with recreation by entangling both swimmers and

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