

Economic Aspects Of Weed Control In The Lakes Of Winter Park, Florida

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The City of Winter Park, Florida, has 14 lakes part or wholly within the city. This represents 800 acres of surface water and over 20 miles of shore line. The lakes, which vary in depth from 30 to 85 feet, are surrounded by 417 home owners.

The lakes are not troubled by pollution per se, but indirectly the affluent society of Winter Park is assisting in polluting the lakes. We build homes around our lakes and proceed to over fertilize our lawns and shrubs, causing the runoff to go into the lakes. This, along with years of septic tank drainage, adds to the nutrients in the lakes.

In this enriched water (which is not harmful for recreation use; nor is it devoid of oxygen), plant material such as submersed aquatic weeds grow abundantly. This is our problem which we are trying to combat by both mechanical and chemical means. The major weeds in our lakes are:

Vallisneria americana—eelgrass

Hydrilla verticillata—Florida elodea

Algae spp.—Filamentous algae

We are also plagued with other weeds but not with concentrations to cause trouble or concern.

The eelgrass growth in our three major lakes, or chain of lakes, has reached a point where boating and other use of the lakes has been greatly hampered.

In October, 1963, the City of Winter Park, Florida purchased from the Aquatic Controls Corporation of Hartland, Wisconsin, an amphibious, self-propelled harvester and an amphibious, self-propelled barge for \$22,000. The equipment consists of two barges, one is 8 ft. by 20 ft. by 20 in., operated with a 30 hp Wisconsin engine containing a 10 foot under-water cutter with a metal conveyor belt that brings the cut aquatic vegetation up and deposits it in a one ton hopper on the rear of the barge. The entire unit is controlled by a hydraulic lever at the operator's control position. The other unit is an 8 ft. by 24 ft. by 20 in. self-propelled barge operated with a Wisconsin engine, coupled with a heavy duty Harnishfeger outboard. This unit is used to receive the cut aquatic weeds from the harvester.

The harvester and barge work together, each requiring one operator. The harvester cuts the aquatic weeds from 1 to 4½ feet in depth. Shallower cutting is not possible because of the cutting mechanism and chains at the bottom of the cutter blade. The hopper, when full, is hydraulically dumped onto the barge. The cut vegetation is then taken to shore and unloaded.

With this type of operation in our three major lakes, last year we removed 1,149 tons of eelgrass. So far this season in Lake Virginia alone we have removed 485 tons of eelgrass.

The efficiency of the unit has been increased from 63% to 76% by a change in method of operation. We can harvest 1.3 tons per hour when in operation. This type of weed control represents a cost of \$10.35 per ton of eel-

grass harvested and removed to the dump, or a total cost of \$11,905.12 per year in mechanical control of eelgrass in Winter Park. The continual need for this operation could be compared to repeated mowing of your lawn.

Florida Elodea is not programmed for harvesting by the harvester because each cutting from this plant, that may escape from the harvester, helps to spread this weed. Florida Elodea is being cut by boat propellers and it is rapidly spreading over our lakes.

In our use of herbicides for control of aquatic weeds, the City of Winter Park has been working closely with Mr. Robert D. Blackburn of Crops Research Division, Agriculture Research Service, U. S. Department of Agriculture. Mr. Blackburn has established several test plots in Lake Virginia, using different herbicides for the control of eelgrass.

From these plots and other research, the effect of one herbicide has caused the City to augment its mechanical control for better weed control. This herbicide, Hydrothol 191, is a mono (nindimethylalkylamine salt) of endothal (3,6-endoxohexahydrophthalic acid). We use the slow releasing granular form for ease of handling and for better area coverage.

We have a standard procedure for applying this or any herbicide. We contact the abutting home owners and those on each side of a given area that we are going to treat. We inform them of the herbicide we are using and the length of time for them to refrain from using the water for irrigation, fishing, and swimming, which is between 10 to 15 days. Warning signs are placed in the lake at the treated areas for information to boaters, swimmers, and fishermen.

To help prevent fish kill we treat only 300 to 400 feet of shoreline area at a time. To date we have not had any fish killed with the use of Hydrothol 191.

During the past year due to the zealous efforts of some of the lake property owners, many have purchased Hydrothol 191 for use along their beach fronts. The Parks and Recreation Department applied the herbicide in order to have control of the operation and to insure even distribution.

Along the shore line Hydrothol 191 is spread at the rate of 4 ppmw, to approximately 35 feet from the shore line where the water depth averages 7 feet. In deeper water (eelgrass will grow to a depth of 15 feet or more) considerably more Hydrothol 191 is required to get the necessary 4 ppmw. This becomes quite expensive as well as almost impossible to maintain the concentration, due to the currents and leaching effects.

To treat the lakes in Winter Park out 35 feet from the shore would cost \$44,161.92. To treat all the surface water in the lakes at one time would require 1,534 tons of Hydrothol 191 or \$828,346.50.

One treatment of Hydrothol 191 is not sufficient to control the eelgrass, but three applications during the first

year along with one application the following does give fair control. However, small plants were reappearing two months after the fourth application.

The average 100 foot lake front home requires 150 pounds of granular (5%) Hydrothol 191 per application. At a retail cost of \$.34 per pound it requires \$153.00 for the first year applications. This is considered as part of the proper expense or the extension of the lawn maintenance, for after all the lake front is in essence part of the overall landscape. Many of the home owners feel this way, which is a great help to us.

From June 1966 to date we have applied 14,375 pounds of Hydrothol 191 in the Winter Park lakes for control of eelgrass. The cost in labor to the City in spreading the herbicides runs approximately \$3.40 per 100 pounds.

In both mechanical and herbicidal means of control for

lake weeds the City spent \$14,054.73 for weed control in our lakes.

In the areas where the herbicide was used three times the first year and twice the second year the control has been fair and will be continued. In areas where we have treated only one or two times, the eelgrass is checked, but Florida elodea has taken its place and is growing vigorously.

One harvester is not sufficient to harvest the lakes before the eelgrass grows back. To stay ahead of this we would have to increase our rate of cutting to three times the present amount; or maintain equipment in each of the three lakes, especially during the summer months. We are considering a new improved harvester, costing approximately \$36,000. The City believes that with continued use of herbicides and the use of the weed harvester in the deeper water we may partially control the lake weeds.