



Florida Engineer Patents **HYDRIONIC METHOD** *For Controlling Weeds in Running Water*

A METHOD OF killing elodea with commercial sulfuric acid has been patented by Robert W. Hyde of Crystal River, Fla. The president of Hyde Engineering Company says the technique will also eliminate other aquatic weed species without harming fish and other wildlife.

Extensive tests were conducted under the supervision of the state Game and Fresh Water Commission during 1965 and 1966, said Hyde, in the spring-fed water in and around Crystal River.

"The system is effective on both hydrilla and milfoil, and most of the waterways and canals in the area were brought into weedless condition in all boat channels during these two years."

Traditional mechanical and chemical approaches to aquatic weed control in the area were complete failures, Hyde contended. The result, he said, was "killing nearly all of our game fish without seriously affecting the weed growth."

"The most important factors of our treatment method," Hyde explained, "are that there is virtually no fish kill, weed eradication is nearly complete, regrowth does not take place within the next six to nine months, and treatment can be done at an average cost of from \$10 to \$20 per acre."

Crystal River presented some rather unique water conditions that contributed to weed growth and at

the same time rendered weed control methods ineffective.

"Our tremendous spring flow—more than two million gallons per hour—plus tide action were just too much water movement to allow chemicals to do their work," said Hyde.

In addition, the water was highly alkaline (pH of about 8.5), having traveled through miles of lime rock before emerging. Aquatic weeds flourish in alkaline water.

The conditions are so unique that one fishery biologist, C. L. Phillippy, suggests that the use of sulfuric acid as a herbicide for control of submersed aquatic vegetation "may be limited to water areas similar to the conditions on Crystal River.

"Neutralization and dilution by

the waters of the many springs, tidal effect, and extensive deposits of calcium carbonate combine to contain the action of the acid within an area in proportion to the magnitude of the problem.

"Its use in static water situations, such as lakes, ponds, reservoirs, and canals with deep cut gliding channels, may create more problems than it solves.

In the Crystal River situation, Phillippy said, "Sulfuric acid did effectively remove elodea from the main channels apparently causing little damage to the fish population. The amount of damage varies from application to application, depending on tidal effects, proximity of springs, and escape route available to fish in the area."

A \$150-test using commercial sulfuric acid and the hydrionic method produced this result in 10 days, says discoverer Robert W. Hyde.



Hydrilla and watermilfoil brought boat traffic to a dead end in fast-flowing Crystal River and canals leading into it. Conventional weed control efforts failed completely.



Hyde, an electro-mechanical engineer and avid bass fisherman and water explorer, turned to a different approach to solving a problem that developed in 10 years after Crystal River had been true to its name for thousands of years. The problem developed from three factors, said Hyde: commercial development of the river banks and the construction of miles of lateral canals, an aquarium nursery venture that got out of hand, and mechanical harvesters ("They might better be called cultivator and spreader," he said).

He was critical of harvesters in this situation because the aquatic varieties being mowed propagate from fragments.

Hydrilla was planted in Crystal River about 20 years ago, Hyde said, by people dealing in the plants and furnishing them to the aquarium trade. The plant is an excellent oxygenator, he said, and grows well in aquariums. As the demand for plants grew, he continued, someone thought of planting hydrilla in the natural spring waters.

Normally, the plant spreads only about six feet a year, Hyde estimated, so planting was not, in itself, a wrong doing. Commercial development, however, brought great numbers of small boats that churned through patches of Elodea. These floated around the bay and canals and finally took root.

The purchase of a mower by the county commissioners, said Hyde, "really finished the job of solidly seeding all the other canals, and, in fact, the whole bay."

Beginning his testing with glass jars and weed fragments, Hyde discovered that by lowering the pH level to 6, the plants died rapidly. Further tests showed that short term contact at higher concentrations of acid also killed the plants.

"Actually, several methods of complete control of elodea and other similar weeds are now practical through the hydrionic method. Most aquatic weeds are extremely sensitive to sudden pH changes, and a change of little more than two points will generally kill all weeds. Lowering the pH of a lake to six will not only kill all present growth but if slight amounts of acid are added from time to time to keep the pH around 6 no regrowth will occur. This is very significant because no fish are affected at this pH. Most game fish are quite comfortable at a pH of 5.

"Canals can be cleaned out very economically by simply dumping in quantities of acid necessary to lower the pH more than two points, even if only on the bottom few inches. Sulfuric is so heavy (nearly twice the weight of water) that it sinks immediately to the bottom and spreads out contacting the stems at the root joints where they soon rot off and float out. If not disturbed by wind or tide, complete decay is always evident in less than two months. This method works equally well on Eurasian milfoil.

"Most Florida waters are so heavily alkaline that the acid is completely buffered out in 24 hours."

Some members of a committee from the War on Weeds Society, Inc., told the Ocala Star-Banner, after evaluating tests, that because the acid had the effect of creating large floating masses, harvesting of the treated weeds might be a necessary part of the treatment.

In one test, the floating mass of elodea was trapped against a bridge and took two months before it completely disintegrated. Where tidal action is present, the masses are carried to sea and destroyed by the salt water.

"Patent rights are available to anyone interested on a modest basis," Hyde said. Hyde Engineering Company, he said, is concerned with developing electro-mechanical products and has "no intention of entering into weed eradication business other than in an advisory capacity."

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