Submersed Aquatic Vegetation In Louisiana

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A serious condition has been developing in the fresh water lakes and streams of Louisiana over the past 8 years as the submersed aquatic vegetation spreads into areas where the surface plants have been controlled. The Expanded Project for the Control of Aquatic Plants provided the authority to destroy all noxious aquatic plants in the waters of the state, but policy dictated that first consideration must be given to the water hyacinth and alligatorweed. No serious effort has been made so far to follow through in an attempt to prevent the spread of the submersed plants and there are no known plans at this time to go ahead with such work on an adequate basis.

The delay can be attributed to the fact that those in important policy making prositions in Louisiana maintain that there are no known herbicides which can destroy the submersed vegetation safely and that a drawdown is the only answer. The Army Engineers in New Orleans dispute this statement and have proven that there are combinations of materials which can produce satisfactory results with no harmful effects on fish and wildlife or people who use the waters.

Another factor in the delay in starting large scale operations is the lack of funds for such work and the admonition of those in authority many hundreds of miles away from the site of the trouble that the water hyacinth and then the alligatorweed should be eliminated before taking on any additional problems.

The situation has become critical in some areas of Louisiana with commercial fishing camp operators taking the brunt of the loss. Drawdowns further complicate their problems by depriving them of places to launch boats or to fish. This causes a close-down of their business for long periods with a resultant loss of income.

An examination of the main waterways and their principal tributaries made in 1963 showed an infestation of submersed vegetation of 57,000 acres. Another check of the same area in 1967 showed that the infestation had increased to 93,000 acres. Rains and weather conditions reduced this to an estimated 83,000 acres in 1968, however, it can be expected that this will increase steadily throughout the state unless some definite control action is taken. Test operations in the past show that it can be controlled.

The research team at the University of Southwestern Louisiana working with the Corps of Engineers and the New Orleans City Park Commission in 1965 demonstrated that coontail, cabomba and chara, which was growing in profusion in the lagoons of the park, could be destroyed by chemicals in a safe manner. The plants were treated with a mixture of 25 lbs of diglycolic acid plus 7 lbs of Esteron "99" (active acid equivalent) to the acre. The mixture was released below the surface of the water into the upper foliage of the vegetation. The application was made in July and an inspection of the area in August of the same year showed that approximately 95% of the vegetation had been destroyed. The City Park authorities passed on the information to other parks and a recent news release in the local paper indicated that the technique is now being used with success nationwide.

In the summer of 1963, the writer observed that Louisiana blackstrap molasses appeared to have some possibilities as a synergistic agent when used with 2,4-D and several test operations were conducted with the mixture. The results were good. It was found that the addition of 20% (volume) of raw, untreated blackstrap molasses to the amine salt of 2,4-D gave very satisfactory results in the control of cabomba when applied at the rate of 6 lbs a.e. per A. coontail and watermilfoil were more easily controlled with the same mixture. Large scale tests were undertaken in parts of Caddo Lake near Shreveport, Louisiana, where coontail, cabomba and watermilfoil were successfully controlled with the underwater release of the molasses and 2,4-D combination. The diglycolic acid and 2,4-D treatment was tested in Lake Wallace in the same area and a 3-acre plot was completely cleared after only one treatment of a single acre. Control in both instances lasted for 2 years.

Heavy stands of elodea were effectively controlled in Lake Martin near Breaux Bridge, Louisiana, through the use of the diglycolic acid and 2,4-D treatment and equally good results were also obtained when the vegetation was traeated with a mixture of 1 part molasses, 1 part Silvex and 2 parts amine salt of 2,4-D released under high pressure beneath the surface of the water into the foliage of the plants. The rates of application of this latter mixture was 6 lbs a.e. per A. of vegetation. No consideration was given to the depth of the water in the treated area.

Information regarding the use of the blackstrap molasses and 2,4-D was given to the owners of the Hodges Gardens near Many, Louisiana. After 3 years of routine maintenance work with the mixture, the submersed vegetation has been eliminated and progress is now being made in the destruction of cattails and sawgrass along the banks of the stream. The addition of molasses seems to change the characteristics of the 2,4-D.

The largest operations for the control of submersed vegetation undertaken thus far in Louisiana were carried out in Lake D'Arbonne near Farmerville, Louisiana. In the summer of 1967 approximately 1,000 acres of submersed aquatic plants were destroyed by using a 20% molasses-80% amine salt of 2,4-D mixture applied at the rate of 5 lbs a.e. per A. The mixture was released under pressure into the profuse growth of coontail, cabomba, watermilfoil and bladderwort. Clear water was observed in many places within 3 weeks while all of the treated area had been substantially cleared in 6 weeks. A conservative estimate based on a careful study of conditions showed an overall control of 80%. Some sections of the lake had been cleaned completely and others, where effective application was made difficult by submerged obstructions, were partially clear. A previous effort to clear the vegetation from the lake by a drawdown had proven to be ineffectual.

Maintenance operations to cleanup some of the remaining plants in order to limit infestation was undertaken in 1968 and resulted in a destruction of 90% of the plants in

the treated area. A drawdown, ordered by the D'Arbonne Lake Commission during September 1968 made further aquatic plant control operations impracticable and the work was suspended for an indefinite time.

With the success thus obtained, it was decided to treat a portion of Black Lake near Campti, Louisiana, in an effort to control the abundance of elodea, coontail, cabomba and watermilfoil. A test area of several acres was chosen near a commercial fishing camp which had been having trouble launching boats and reaching the best fishing grounds.

Four mixtures were used in separate test plots. Applicatnon was directly into the vegetation as in the case of previous test operations. Mixture No. 1 consisted of copper sulfate and water applied at a rate of 1 ppm. Mixture No. 2 was a combination of 1 quart blackstrap molasses plus 4 quarts of the 40% amine salt of 2,4-D applied at the rate of 4 lbs a.e. per A. Mixture No. 3 consisted of 1 quart of molasses plus 1 quart of silvex plus 2 quarts of 40% amine salt of 2,4-D applied at the rate of 4 lbs a.e. per A. Mixture No. 4 contained the same ingredients in No. 3 with the addition of 1 ppmn of copper sulfate. The mixture was applied at the rate of 4 lbs a.e. per A.

Since all of these mixture closely approximate the specific gravity of water when dispersed there was little tendency for rapid sinking of the materials and it remained in a given layer for periods sufficient to permit satisfactory absorption. The plants act as blotters and assist in holding the material in the layer pattern. Water temperature was 86°F at the time of the test. No consideration was given to the depth of the water in the treated areas. The applications were made on 5 August 1968.

An early examination made on 28 August 1968 showed the following reduction in area of the treated vegetation Plot 1 = 5%, Plot 2 = 10%, Plot 3 = 30% and Plot 4 = 45%. A re-examination made on 30 October 1968 showed the following control: 70%, 80%, 100% and 100%, respectively. It was concluded from the observations that the copper sulfate had little additional benefit and it was decided to discontinue its use. The surprising parts of these tests was the apparent satisfactory control of the elodea and cabomba which normally resist the herbicides. Coontail and watermilfoil were controlled easily in other areas by the 20% molasses — 80% amine salt of 2,4-D and there appeared to be no need to go to the additional expense of adding silvex when these plants were encountered. Silvex is an advantage when added to the molasses and 2,4-D when elodea is found in the area to be treated.

All applications were made beneath the surface of the water through flexible tubes spaced 12 inches apart on an 8-ft boom mounted over the stern of the outboard skiff used in these tests. The length of the flexible tubes was regulated to release the herbicide into the dense foliage of the growing plants. The spray pattern was one of parallel trips of the boat about 10 feet apart and the speed of the skiff was about 2 miles per hour. Surface spraying in test areas showed no appreciable results and were not attempted after the first trial. An in-line mixing device developed by the writer was used to mix the concentrate with water from overboard prior to its release and dispersion trough the underwater spray nozzles on the lower end of the flexible tubes.

A single "cold weather" application was made on the submersed plants in Saline Lake in the northern portion of Louisiana, after the plants had settled to the bottom of the lake, to determine what effects such a treatment might have on the vegetation. When the water reached 70°F in the following year, the untreated plants reached the surface of the water while the treated plants were delayed some 5 weeks. The writer retired from the Corps of Engineers before similar tests could be repeated, but it is believed that the results from the initial test show that some results may be obtained through the cold weather treatments of submersed plants found in the "Deep South".

All of the foregoing work was of an experimental nature to determine what materials might be used under different conditions and to develop the technique for subsurface applications. The treatments described worked well in the waters of Louisiana, but variations of the mixtures might be necessary in other sections of the country to produce similar results.

Unless some very definite control measures are initiated today, "tomorrow" might be too late to avoid a long and costly campaign against the rapidly spreading menace created by the submersed aquatic vegetation. The impending threat to the safe and economical use of our natural waterways demands immediate attention.