

# The Use Of Acrolein For The Control Of Elodea

By

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*Elodea densa* was introduced, means unknown, some years ago into the Lake Osborne area where it became firmly established. It was first noticed in Palm Beach County about 1930 by Mr. Jack Goss, Director of the County Park Department, in the Keller Canal immediately adjacent to and leading into Lake Osborne. At this time the prevailing massive growths of hyacinths probably played an important part in suppressing and inhibiting its growth and spread through shading. Whether or not the County dredging activity in the Lake Osborne area was a contributing factor preventing its spread is questionable. Such drainage work did contribute to the clearing of this area, making possible new settlements resulting in a population explosion with the accompanying increase of new residential home sites. As elodea became increasingly more abundant, the people were not able to use their boats for pleasure cruising, water skiing and fishing — many also strongly objected to this plant's unsightliness.

With the advent of 2,4-D, the County as well as other organizations undertook the control of hyacinths for the purpose of opening up congested waterways. In doing so this alleviated quite a few problems but as in most cases, when one problem is eliminated, another or others are created. Hyacinths are of the utmost importance to any mosquito control department as these plants afford a condition ideal to maturing mosquito larvae for certain species. In the first place, protection is afforded the malaria mosquito larvae, and likewise for certain of the culicine larvae that are not only pestiferous, but are vectors of diseases important to the health, comfort and welfare of the human race. In addition, these plants serve as the host plant of three species of *Mansonia* mosquitoes found in this area which may transmit encephalitis. So, in thinking in terms of benefits derived through hyacinth control, emphasis was placed on the destruction of this plant which eliminated the shade and was conducive to increased water flow and added to the consequent spread of elodea. Fortunately, there is no correlation between elodea and mosquitoes, and of the two evils the water hyacinth presents the more serious problem.

*Elodea densa* reproduces not only by seeds, but also vegetatively by means of any segment of the plant containing a node. We have found plants attached to the bottom at depth ranges of 10 to 12 feet. It has also been our finding that it need not be affixed to the bottom but can continue its growth unattached.

Using Lake Osborne as a typical example where elodea has infiltrated by means of boats, trailers, water currents and other means, a study was made to determine a method of control. Our Park Department thus constructed a cutter boat to use as an underwater mowing machine. This did not prove satisfactory and probably contributed somewhat to the plant spreading. Then, in conjunction with personnel of the Mosquito Department, a chemical recommended by a commercial concern was tried without success.

The people in the Lake Osborne area continued to complain so much about "the Green Pasture land" that we contacted the U.S.D.A. Plantation Laboratory and they were most helpful and obliging in testing in our areas additional

chemicals that might effectively control elodea. Of all materials tested, acrolein in our opinion, was outstanding. We are currently using this chemical not only in the Lake Osborne area but in Lake Ida, in inter-connecting canals and other bodies of water where elodea presents a problem.

It is our prediction that elodea will become an increasingly serious problem due to increased boat traffic, overflows through pumping stations and natural water flows in South Florida.

Acrolein is a colorless liquid at normal temperatures with a very acrid, pungent odor. It is a poison by inhalation, by swallowing and by skin penetration. It has excellent warning properties being extremely irritating at concentrations below those hazardous. Contact of the liquid with the skin frequently causes burns.

Acrolein is classified by the Interstate Commerce Commission as a flammable liquid. Its vapors can form explosive mixtures with air.

Through the cooperation of Mr. Robert Blackburn of the U.S.D.A. Plantation Lab, west of Ft. Lauderdale, test plots were designed and treatments made. A concentration of 4 ppm was finally recommended for control of *Elodea*.

Acrolein, as used by our department, is received in special 55 gallon drums. Upon application a drum is lowered into one of our airboats by means of a winch truck. After the drum has been upended the two bungs are removed by personnel wearing gas masks with black cannisters. Into the smaller opening a valve with a pressure gauge is secured for the introduction of CO<sup>2</sup> for working pressure. Into the larger opening is placed a ½" I.D. brass pipe to facilitate discharge. Brass is used to eliminate a spark with the drum. Connected directly to this brass outlet pipe by means of a globe valve is a flow meter to which is connected another globe valve. The acrolein is then transported to the stern of the airboat by a ½" clear plastic hose. The hose connects to a pipe affixed across the exterior transom at or near the water line. This pipe has 6 equally spaced 3/16" diameter outlets extending 1" downward at about 45°. Attached to each of the outlets is a 6" section of rubber hose to inject the chemical under the surface and allow flexibility for running aground or over logs.

Before an area is treated it must be surveyed to determine the amount of chemical needed at 4 ppm. This is accomplished with the use of an aqua probe to get depth readings. After soundings are made an average depth is determined and in conjunction with the surface area the number of gallons can be calculated. Then the flow meter can be set at a given number of gallons/minute and the application timed to give accurate dispersal. Within 6 to 8 hours after application, noticeable affect on elodea is achieved. One week after treatment the dying weed has settled to the bottom. Control will vary from 4 to 8 months with the longer control during colder weather.

Two disadvantages with the use of acrolein are that fish are killed (shad, trash fish, are affected first) and that the personnel are working with a hazardous chemical that is highly flammable and toxic.