

# What Destiny--Aquatic Weeds

JOHN A. MULRENNAN, *Director*

*Bureau of Entomology  
Florida State Board of Health  
Jacksonville, Florida*

When I was a boy, over a half century ago in Hillsborough County, the only weeds that caused me any consternation were nut grass, Bermuda grass, and sandbur grass which had an affinity for growing like mad in the corn, sweet potatoes, cassava, and turnip rows. I learned early, at the end of a hoe handle and by walking behind a mule and "grasshopper plow," that controlling weeds was a hot, never-ending job, and that one should never put off until tomorrow what could be done today. I am sure, from my observation around the state for the last twenty-five years, that in the field of aquatic weed control the old adage still holds today.

Fortunately, in the pioneer era of our country, we did not have water hyacinths and other obnoxious weeds in Turkey Creek, Alafia and Hillsborough Rivers, and the many ponds and lakes where I spent my early boyhood days fishing and swimming with one of my uncles--when I was not hoeing, plowing, or grubbing oak roots to clear more land for planting orange groves and field crops.

The one thing that was always impressive was the abundance of large-mouth bass that could be caught in the many bodies of water. This was always a great thrill to a young boy at the time when the action was taking place. It was a different story when we had to carry the bass on our backs for a distance of two miles home. There was no limit on the number you could catch, nor was there any pollution, hoards of midges, or obnoxious weeds to consider, as we know them today. There was cecum grass and wild pepper weed that grew around the edges, and large pond bonnets that grew out into the edge of the deep water of old Cross Pond, which actually was about an eighty acre lake. In the middle "teens" the old pond went, as many others have gone in the state. It was drained to increase pasture land. The pond was owned by one of Florida's most prominent cattlemen of that day, Mr. D. O. Fulton, President and major stockholder of the Tampa Packing Company. The junior partners of the business at the time were those well known to citizens of Florida today, the Lykes Brothers.

It was of great interest to a young tike to listen to the stories of Mr. Fulton as he stood in his blue overalls and a cotton undershirt and as he spat tobacco juice, and pumped water with a pitcher pump into a long wooden trough in a cow pasture where he had around fifty steers fattening.

He said, "Johnny, you know I came to Florida from Georgia when I was a young man (he was then in his late sixties) with fifty cents in my pocket. I got my first job cutting cord wood at fifty cents a cord. This was long before the Spanish American war. I saved all the money I could get my hands on and purchased cattle." He said, "You know that was the smartest investment I ever made because during the war all troops and provisions were shipped out of Port Tampa. The federal government required that all cattle to be loaded on the boats at night

had to be watered before they went aboard. They were shipped alive to Cuba since there was no refrigeration, and it took about a day and night to make the trip." He said, "You know that requirement was like manna from heaven, because we knew to keep the cattle on a dry range all day and drive them through a slough and let them fill up their "bellies" with water before they were driven to the boats to be weighed and loaded for the trip to Cuba. As you can imagine, a lot of money was made out of slough water in a steer's "belly." It has forever given me a great feeling of satisfaction to watch steers drink water, and that is why I am out here today." He said, "I tell you one thing, Johnny, if we don't conquer this Texas fever tick, I am afraid there is not going to be any cattle left in Florida to drink water."

Here I was given my first lesson regarding the importance of the control and eradication of an arthropod that was wrecking the cattle industry in the state. Mr. Fulton, being a man of vision and knowledge of the problem, had built a dipping vat on his place, and had impressed on all the farmers in the area the importance of dipping their livestock. In fact, it was not a hard-selling job, because everyone was losing more cattle each year when calves were being born. Everyone for miles around took advantage of the free dipping, which was taking place a number of years prior to the federal eradication program.

I learned here for the first time the importance of community action at the grass roots. This action and unity of purpose had molded in me an everlasting imprint that demonstrated that great and outstanding accomplishments can be brought about at the local level if proper assistance and competent direction is made available.

I was also fortunate in later years to be placed in charge of two eradication programs in the state. These programs, eradication of malaria and typhus fever, were brought to a successful conclusion. Many years later, at the present time, we are engaged in the eradication of the yellow fever mosquito, *Aedes aegypti*, that played havoc with this state just before the turn of the century and was responsible for the formation of the State Board of Health in 1889.

I learned that complete and uninterrupted directions, from the top to the bottom, are essential in an eradication program. There can be no weak links in the chain of command.

In an on-going control program, such as I have also been associated with for over a quarter of a century, whether it be mosquito control, rat control, sanitation, or weed control, the actual everyday operation can be more effectively and economically performed at the local level when the officials are furnished with the proper methods of control and given financial assistance and technical advice and guidance. I personally believe that the state's present mosquito control program is a good example of such an effective program. The state, county, and district cooperative mosquito control programs have become one of the greatest

success stories to be found in this country. In the beginning, there was great agitation and long editorials were written in some of Florida's newspapers recommending that a State Commission be set up to control mosquitoes. This philosophy was opposed by the State Board of Health and the Florida Anti-Mosquito Association and we were able to sell the Governor of the state and the State Legislature on the need for funds for research and research facilities, and financial aid to the counties and mosquito control districts. In 1952, I made a number of talks to members of the legislature all over the state. In Marianna I told a group of legislators that I knew they had a big watermelon to cut in the next session of the legislature, since they had a 40 million dollar surplus. I told them that I did not want even a little piece of the melon. All I wanted was one little seed for mosquito control. I would plant the seed and grow greenbacks for the state.

After I got through with my talk, a legislator in the back of the room asked me how large was that watermelon seed. I told him two million, five hundred thousand dollars. Everyone let out with a big laugh, but I had made my point and gained the confidence of the legislature. Different legislators during the session asked me when I was going to plant the watermelon seed. I would tell them just as soon as you give me a seed. They would tell me, "Do not worry we will see that you get your seed." I finally got my seed with a vote of thirty to one in the State Senate and with only seven dissenting votes in the House.

I have kept my covenant with members of the legislature because at that time the tourist industry was bringing in around nine hundred million dollars a year and at the present time the industry brings in around 6.5 billion dollars a year. I am confident that the watermelon seed has paid off.

There is no one today that can sell me on the idea that you can efficiently operate a group of planes and other equipment out of a central location in the state, pay per diem, and take care of local problems caused by outbreaks of mosquitoes, water hyacinths, or vegetation blocking ditches that need to be cleared of vegetation to stop mosquito breeding or to relieve flooding conditions. This type of operational work is, in my judgment, a responsibility of the local areas and should be supervised by elected officials close to the people and the problems.

Practically all of Florida's coastal counties and many of the central counties now have the equipment, personnel, and know-how to cope with all of the arthropod problems as well as the aquatic weed problems involved with ditches, canals, ponds, small rivers, and creeks found in the various areas. Their only additional need would be financial aid from the state to assist with the work. In fact, some of the most respectable aquatic weed control projects I have observed recently were in Dade and Lee Counties, which have local agencies to perform their aquatic weed control. However, there is no question in my mind, that where eradication of particular aquatic plants must be taken into consideration, and where large lakes are involved in sparsely populated counties, a state organization must be given the specific responsibility for eradicating or abating such problems.

The U. S. Corps of Engineers should be supported in their work of controlling aquatic weeds in all water impoundments and tributaries under their jurisdiction.

There is an excellent federal aquatic weed control re-

search laboratory in Broward County that should receive the backing of all persons in the state involved in aquatic weed control. I see no reason why the state should not furnish the personnel, equipment, and research materials necessary to expand the scope and necessary activities of this laboratory that now has scientists qualified to do the necessary planning and to give proper direction

The State Legislature, in my humble opinion, should amend the pollution control law to include aquatic weed control under the Air and Water Pollution Control Commission. Aquatic weed production is an integral part of water pollution. In fact, in many ditches, canals, and other bodies of water, the abundance of aquatic weeds is directly proportional to the nutrient materials that are going into the bodies of water from sewage treatment plants, industrial plants, agricultural production, etc. There are now three or four state agencies, as well as many local agencies, involved in weed control and their work should be coordinated. I personally think that it was a great and wise move when the State Legislature created the high level pollution control commission for it has been needed for a long time. The one improvement that I would further recommend would be for the commission membership to be made up of the elective cabinet. There should be a technical advisory council spelled out in the law and appointed by the Governor from members of state agencies, universities, industries, and from the public at large to assist in steering the cabinet and its director in technical matters and hopefully in recommending solutions to the many air and water pollution problems with which the state is now confronted. If solutions are not found to many of the problems in our tributaries, rivers and lakes of this state in the near future, many of the bodies of water will become unfit and dangerous to live near or adjacent to due to the abominable numbers of aquatic midges and the great production of *Culex* mosquitoes that transmit St. Louis encephalitis.

Living near the Saint Johns River from Palatka south, in dry winters and springs, is becoming unbearable due to the increased enrichment of the water and the corresponding buildup of the midge population. The same conditions are becoming worse around many of the lakes of the state that are being enriched. In the Dade County area, developers are digging small lakes and building waterfront homes around the lakes. Small sewage treatment plants supporting the developments are emptying sewage effluent into the man-made lakes and the blind mosquitoes produced by this enrichment are coming off in great hoards and are taking over the house to the consternation of the homeowners.

In many areas of the state where there is not a sufficient dilution factor, ponds, swamps, streams, canals, and ditches are producing *Culex quinquefasciatus*, one of the encephalitis mosquitoes, in massive numbers unless constantly controlled by the local mosquito control organizations. It might be mentioned in passing that similar conditions which were not controlled were responsible for the St. Louis encephalitis epidemic recently in Houston and Dallas, Texas.

There is not a great deal new that can be reported in the relationship of mosquito breeding to aquatic plant production beyond what was reported in 1962. One of the predictions I made, that man-changed environments could bring about encephalitis epidemics, became a reality in the summer and fall of that same year. A high *Culex*

density, and a high bird population, principally mourning doves that were being fed in the populated area, were responsible for the state's first encephalitis epidemic. It was estimated that this epidemic cost the Tampa Bay area of the state over forty million dollars.

We now know that *Culex nigripalpus* was the vector. It is a prevalent tropical mosquito that breeds in great numbers in ground water areas that immediately fill with water after a rain. It will breed in gigantic numbers in canals and permanent bodies of water when vegetation or water hyacinths are killed. The mosquito will actually hold her eggs until she finds a desirable site to lay her eggs.

It can readily be seen that proper management of the water distributed in and over the land is now, and will continue to be in the future, one of Florida's most pressing problems, since the number of sewage treatment plants is increasing each year.

The conservation of human drinking water should always receive first priority regardless of all other considerations. The protection and management of water supplies for agricultural purposes, and conservation of natural resources should also be given top consideration provided that such water management does not jeopardize the lives and health of the tourists and the static population.

This is why it is so doubly important that the state's elective officials of the cabinet make the final determinations after they have received their mandate from the State Legislature as to how the waters of this state will be managed in the future for the best interest of all the people of the state.

The management of surface waters for drinking, water for agriculture, industry, fish and wildlife, conservation, recreation, health protection from arthropod borne diseases and also safeguarding of the static and visiting population from obnoxious arthropods must be weighed in all its aspects for the greatest good for all.

In order to bring about a balance and to give the proper protection to all segments of our economy, research is demanded, especially in the field of pollution and enrichment of bodies of water that are producing gigantic hoardes of aquatic midges and fish kills by hyper-eutrophication of our present natural surface fresh waters. A way must be found to put the enrichment back upon the soil and not in the bodies of water; otherwise the bodies of water may become the hay fields of the future and the population will have to be warned that if they live near such enriched waters and fish upon them that they do so at their own risk. That, in my judgment, is where we are headed. Learn how to put the enrichment back in the soil where it came from in the first place for the most part, or suffer the consequences of being smothered with aquatic midges and epidemics of arboviruses.

In order to reverse this cycle, it is apparent that it will take the mastery of the soil scientist, agronomist, and agricultural engineer, unless the sanitary engineer and the water chemist can figure out ways to take out the chemical elements that are enriching and over balancing semi-permanent and permanent bodies of water in the state.