# Certain Environmental Factors that May Affect the Growth of Submersed Aquatic Weeds in Florida Canals

*By*

R. D. BLACKBURN, P. F. WHITE, and L. W. WELDON*

Submersed aquatic weeds in irrigation and drainage canals are rapidly becoming a major problem in central and southern Florida. Engineers of the area have long wondered whether canal design can be changed to reduce the growth of submersed weeds in the large irrigation and drainage canals. Before the canal design could be changed, however, information was needed on various biological, chemical, and physical conditions which influence growth of submersed weeds.

Five canals in a 60-mile radius of Fort Lauderdale were studied. Light penetration, phosphorus and nitrogen compounds, sulfates, tannic acid, and turbidity contents of canal waters were found to have the greatest influence on weed growth. Percent of full sunlight present at the 15-ft. depth varied from 0 to 45. Tannic acid and amount of turbidity in the water affected the amount of light which penetrated the water in these canals. The tannic acid was related to area drained by each canal, with the greatest tannic acid concentration being found in canals draining the organic soils of the Everglades. Turbidity appeared to be related to the canal flow, with the greatest turbidity being found in the canals with greatest flow. The depth of maximum submersed weed growth in canals varied from 3 to 12 ft. Above and below these depths the plants were chlorotic or etiolated.

Phosphorus and nitrogen compounds, which are usually growth-limiting factors in the aquatic environment, were found to be relatively high in the canals. These compounds appeared to be entering the canals from leached fertilizers, septic tanks, and sewage treatment plants. The sulfate content was also found to be unusually high in all five canals. Salinity varied from 125 to 450 ppm and appeared to be influenced by the hydrologic head, canal flow, and rainfall.

The findings indicated that canal design can be changed in certain areas to reduce submersed weed growth. However, this would be related to the "angle of repose" of the soil material through which the canals are excavated, or the natural ratio of the horizontal distance to vertical drop of the side slopes.

*Cooperative investigations of the Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, the Central and Southern Florida Flood Control District, the Corps of Engineers, U. S. Department of the Army, and the Florida Agricultural Experiment Station.

# Hyacinth Control In Lee County, Florida

*By*

T. W. MILLER, JR.

*Director Lee County Hyacinth Control*

Three years ago this week, the Governor of the State of Florida, signed into law Chapter 61-2404, and thereby created the Lee County Hyacinth Control District, a special taxing district organized to control water hyacinths in Lee County. The purpose of this paper is to report to you that the District has functioned to accomplish its purpose, and in general, has met with acceptance by the tax-paying residents of the county.

Prior to creation of this special taxing district, Lee County was plagued with noxious aquatic weeds — the principal problem being the water hyacinth. Although some control work was carried out as part of a statewide program by the hyacinth control division of the Game & Fresh Water Fish Commission, this effort was limited by a restricted budget and the vastness of the problem area. Generally, these limitations meant that water hyacinth control in Lee County was available only after major streams were completely clogged. When this situation existed, the state hyacinth control crews moved in, and worked to clear our river and the main tributaries. Time and money again prevented control work in many minor streams and farm canals throughout the area, and it was generally accepted that work directed toward the control of water hyacinths was over until the situation became desperate once again, — and thisit did! In 1960, a major infestation of water hyacinths resulted in the Saturday Evening Post including Fort Myers, our county seat, in its "Face of America" series, with the caption "Watery Jungle." The story accompanying the two-page color photograph stated, "In Florida—where these boats sit all forlorn in the Caloosahatchee, near Fort Myers, clearing hyacinths out of inland waters is a never-ending job." To a county which derives some $3,000,000 of its annual income from the tourist industry, this publicity was at best, undesirable.

Taking their cue from this story, and agreeing that control of this problem was, indeed, a "never-ending job," the Lee County legislative delegation acted to implement a program which would provide adequate control on a local basis. After consideration of several alternatives, it was decided to create a special tax district, specifically for the control of water hyacinths. In the interest of economy, the legislative delegation wished to use an existing agency to carry out its purpose, rather than to set up an entire, new organization. Accordingly, they appeared before the Board of Commis-sioners of the Lee County Mosquito Control District; outlined the problem, and requested that the Board consider serving in a dual capacity. After consideration of the facts that someone had to cope with the problem, and that the mosquito control agency seemed best equipped to puruse a program of chemical control, the Board agreed to accept the increased responsibility, provided that the Legislature would authorize such a program and provide funds for an adequate program.

This was accomplished when the act creating the District became law, and the Board was authorized to levy a tax of one-quarter of a mill for this purpose. This tax levy produces slightly more than $50,000.00 annually, and does provide what we feel is an adequate program for the residents of our area.

During the three years of its existence, the Lee County Hyacinth Control District has purchased an office and warehouse adjacent to the mosquito control headquarters; it has acquired boats, motors, pumps, vehicles and other necessary equipment. The District has hired its own personnel, and operates independently of the mosquito control program. However, our three years' experience has assured us that the programs do complement each other. Both equipment and personnel are used interchangeably as the need arises, and quantity purchases under a single contract, reduce the cost of many items for both districts.

In our opinion, the principal advantage of a local district such as ours is the restricted area for which we are responsible. We are close enough to our problem to observe any outbreaks