



# Results Of Various Aquatic Weed Control Measures Tested In Leon County, Florida

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In our haste to satisfy fishermen and farm pond owners we have very little time to actually assess the value of aquatic herbicides and their effectiveness on the aquatic weeds of this region.

It is the purpose of this paper to evaluate some of the available herbicides and determine their effect on our more troublesome vegetation.

Lake Jackson, near Tallahassee, Florida (Leon County), has been used in the past, (Phillippy, 1961) for weed control experimentation. For this reason plus the fact that it contains a wide variety of vegetation, it was selected as one of the experimental sites. Macomber and Crittendon (1955) reported a narrow fringe of maidencane and a few rushes. Since their survey the lake has become more than two-thirds covered with vegetation, much of it growing in 12 feet of water. A list of aquatic plants can be found in Table 1.

Table 1. Aquatic Vegetation Present in Lake Jackson.

Type of Vegetation	Scientific Name	Common Name
Submerged	<i>Utricularia</i>	Bladderwort
	<i>Cabomba caroliniana</i>	Fanwort
	<i>Bacopa caroliniana</i>	Water hyssop
	<i>Spirodela polyrhiza</i>	Duck weed
Floating Emergent	<i>Nymphoides aquaticum</i>	Floating heart
	<i>Nelumbo lutes</i>	Lotus
	<i>Panicum sp.</i>	Maidencane
	<i>Pontederia cordate</i>	Pickeralweed
	<i>Polygonum sp.</i>	Smartweed
	<i>Brasenia schreberi</i>	Watershield
	<i>Nymphaea odorata</i>	White waterlily
<i>Nymphaea flava</i>	Yellow waterlily	

Lake Miccosukee, located about six miles west of Monticello, Florida (Jefferson County), has had a history of drastic fluctuation before stabilizing dams were constructed in 1923. In 1956 when the lake was dry a wild fire developed but was extinguished when fears arose that the underlying peat would catch fire. When the lake refilled most of it was free of vegetation. Bass and bluegill fishing was quite good and waterfowl were abundant.

Maidencane gradually covered all but about 40 acres of the 7500-acre lake. (See Table 2). In 1964 vegetation was so thick that a cutter could not cut boat trails. No fishing and very little hunting have taken place in the past year.

Table 2. Vegetation Present in Lake Miccosukee.

Type of Vegetation	Scientific Name	Common Name
Submerged	<i>Utricularia sp.</i>	Bladderwort
Emergent	<i>Panicum sp.</i>	Maidencane
	<i>Brasenia schreberi</i>	Watershield

A number of aquatics were noted on the lake but no attempts were made to identify them. Only those found in the one acre plot are listed.

## METHODS AND PROCEDURES

In Lake Jackson nine experimental plots one-quarter acre in size were established on the south and west sides. A line 209 feet long was used to mark the plots. Steel fence posts eight feet long were placed at the corners. Buffer strips of one-quarter acre were left between the plots.

Water depths were measured by use of a weighted rope marked off in feet. Average depth was slightly over six feet.

An air boat was used for applying the herbicides to the vegetation. The proper amounts (see Tables 3 and 4) were placed in a 30-gallon drum and water added as a carrier. The amount of water added was not measured but was enough to assure good coverage. A Beam spray gun was used and set for a fine droplet for the spraying of emergent vegetation. A nozzle size of three-sixteenths (3/16) was used when the chemical was injected into the water for submerged aquatics. All spray work was completed in the early morning at wind velocities of less than 5 m.p.h.

Rock salt was broadcast by hand from the airboat and a fairly even coverage of the plots was obtained. It was believed that a temporary rise in salinity to a lethal level for maidencane might pave the way for drilling a salt water well on the larger lakes.

#### Chemicals Used

Product	Manufacturer
Diquat	California Chemical Co.
Paraquat	California Chemical Co.
Aquathol	Pennsalt Chemical Co.
Aquathol Plus	Pennsalt Chemical Co.
Rock Salt—NaCl Sodium Chloride	Diamond Crystal Co.

Spraying of Lake Miccosukee has been disregarded due to the ineffectiveness and cost of any available chemical. Mechanical control, as was previously noted, has been stopped because of the inability of the cutter to penetrate the thick growth.

Natural control in the form of water hyacinths, it was theorized, would shade out the maidencane and would leave only the easily killed hyacinth.

Table 3. 2.5 Weeks after Treatment — Lake Jackson.

Plot	Maiden-cane	Lotus	Water-lily	Water-shield	Bladder-wort	Fanwort
#1 Aquathol plus 3 ppm injected in water	4	3	3	2	0	0
#2 Aquathol plus 2 qts. sprayed on top	5	10	10	4	1	0
#3 Diquat* .7 ppm injected in water	1	0	0	0	6	10
#4 Diquat 2 qts. sprayed on top	8	5	5	4	0	0
#5 Paraquat 3 ppm injected in water	8	1	1	5	3	3
#6 Paraquat 2 qts. sprayed on top	10	9	9	4	1	1
#7 Aquathol 3ppm injected in water	None Present	None Present	None Present	None Present	0	0
#8 Rock salt 200 lbs. per acre	0	0	0	0	0	0
#9 Rock salt 600 lbs. per acre	0	0	0	0	0	0

\*We have used Diquat previously at recommended strength and obtained favorable results. This was an attempt to try to reduce cost.

Vegetation not listed was not present in large enough quantities to give a fair report on susceptibility.

Table 4. 6 Weeks after Treatment — Lake Jackson.

Plot	Maiden-cane	Lotus	Water-lily	Water-shield	Bladder-wort	Fanwort
#1 Aquathol plus 3 ppm injected in water	0	2	2	0	0	0
#2 Aquathol plus 2 qts. sprayed on top	2	9	9	2	0	0
#3 Diquat .7 ppm injected in water	0	0	0	0	2	2
#4 Diquat 2 qts. sprayed on top	1	4	4	3	0	0
#5 Paraquat 3 ppm injected in water	2	0	0	3	0	0
#6 Paraquat 2 qts. sprayed on top	3	9	9	4	0	0
#7 Aquathol 3 ppm injected in water	None Present	None Present	None Present	None Present	0	0
#8 Rock salt 200 lbs. per acre	0	0	0	0	0	0
#9 Rock salt 600 lbs. per acre	0	0	0	0	0	0

A one-acre square plot was fenced with poultry wire extending one foot above and one foot below the surface of the water. The fence was used to prevent hyacinths from being blown to the other locations on the lake.

Hyacinths were hauled by boat from a bed just below the dam on Highway 90 and were placed in the fenced area until about one-fifth of the surface was covered with them. Plants were not out of the water for over twenty minutes.

The transplanted hyacinths were able to survive for the summer but did not reproduce and died early in the fall. It is not known why hyacinths will not thrive on the lake as they grow in abundance below the dam in the same water that flows out of the lake.

The maidencane apparently will not allow normal hyacinth reproduction and this method of control for this lake has been disregarded.

#### CONCLUSIONS

None of the chemicals tested gave sufficient control of the maidencane to warrant further use on a large scale program. It was felt that quarter acre plots on this large body of water allowed excessive lateral movement of the herbicides. This was especially evident in the plots where rock salt was used. Lethal concentrations are diluted rapidly and it is recommended that where possible, future sample plots should be on small lakes.

All chemicals had some degree of effectiveness on lotus, waterlily, watershield, and with the exception of Diquat, relatively little control on bladderwort and fanwort.

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