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SPONGE CULTIVATION

by

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Recent surveys carried on in the Gulf of Mexico in behalf of the Florida State Board of Conservation indicate that there is very little possibility of extending the natural sponge fishery in United States waters and that full recovery of the beds is not likely to take place for a considerable time. It is, therefore, strongly urged that sponge cultivation be started, either by government or private enterprise, for the dual purpose of increasing the available supply of sponges and also to make possible an experimental re-seeding of the middle and deep ground of the Gulf sponge fishery.

There have been several attempts to start a sponge farming industry in the past and it may be worth while to examine the reasons for their failure before making detailed proposals for future attempts,

The earliest attempts to set up practical sponge farms is that of Gregor Buccish in 1867. His plantation, off the shores of Lesina, near Trieste, used sponge cutting 1 cubic inch in size, planted upon stones and upon pegs and stakes. He found that his cuttings took about seven years to reach marketable size, and claimed that losses did not exceed ten percent. Nevertheless, because of unnecessarily elaborate nature of his methods and because of the hostility of the spongers the project was eventually abandoned.

Later, in 1879, Mr. Fogarty began cultivating sponges near Key West. His cuttings, about two and one half inches long, were threaded on wires and sticks. For some reason he did not complete the experiments.

In 1880 R. M. Munroe planted sponges on stones and various types of wooden frames and hurdles. Losses from theft and failure to follow through with it probably account for the end of this experiment. As a result of it, however, an attempt was made to bring a sponge culture law through the Florida State Legislature. Unfortunately, it failed.

An attempt [was made] by J. V. Harriss in 1897 to grow sponges, upon galvanized wire, at Sugar Loaf Key. This was abandoned when the wire rusted through.

H. F. Moore of the U. S. Bureau of Fisheries made the most careful experiments in 1901 at Sugar Loaf Key and in Biscayne Bay. Several methods were tried. Sponge cuttings attached to cement discs grew successfully, reaching market size in four to five years. Losses due to various causes amounted to 30% in four and one half years at Cape Florida and 14% in three years at Sugar Loaf Key. Sponges planted in this area proved that cultivation could be successfully carried out. Lack of interest at the time and the failure of planting an Anclote Key brought some measure of discredit upon the idea and it was not followed up on a commercial scale.

Experiments by Moore, Cheyney, Bigelow and others, at Anclote Key failed because of the frequent influx of fresh water in this area. It was thus demonstrated that with proper methods the cultivation is quite practical, but that the careless selection of a site, improper methods, the activities of thieves, and lack of public interest has prevented the further development of such an industry.

In the Bahamas the present author was instrumental in planting over 100,000 sponges for the Government. Although a large proportion of these were lost by the disease of 1939-1940, and most of the remainder were stolen when the government subsequently lost interest in the beds, the practical possibility had been demonstrated and Mr. Penny Smith had started a flourishing private plantation of his own. This is now owned by Mr. C. O. Pancake, at Pott Cay, Andross Island and is producing sponges of excellent quality.

Sponges require muddy bottoms, a good water current but not too much heavy wave action, and freedom from the inroads of freshwater drainage. They require to be planted in such a way that they are not smothered by the mud, since in deep water the cost of planting and harvesting is made prohibitive by the need for divers.

These requirements are fully met in a large number of places near the outer line of cays between lower Matecumbe and Cape Florida. The actual cost of planting is a little difficult to estimate. At the time of writing a financial analysis of Mr. Pancake's planting has not come to hand. The following is based upon planting a twenty acre area, using one laborer working full time.

CRUDE ESTIMATE OF COST OF COMMERCIAL SPONGE PLANTING
(assuming best possible conditions and location)

Annual Costs

Cement Discs 20,000 at 0.05 100,000. These may be re-used. Cost spread over 5 years	$ 1,000.00
Cuttings 20,000 at 0.20 100,000. These will later be taken from the stock. Cost spread over 5 years. Each cutting 0.20 if valued at $12 per lb.	4,000.00
Labor 2 men at $2,500 (Planting 20,000 cutting each year)	5,000.00
Maintenance of boats, sheds, etc.	2,000.00
	$12,000.00

Annual Income

12,000 sponges (6's)	24,000.00
at $12 per lb.	12,000.00
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Profit	$12,000.00

* Total planted, 100,000. Losses 40% bearing 60,000 over 5 years.

Capital investment

Cabins and sheds	$ 7,500.00
Dinghies and outboards	1,000.00
Live cars	1,000.00
Large vessel for transportation	5,000.00
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	$14,500.00
Cost of operation prior to first crop of sponges (5 years)	$ 60,000.00
Total capital required	$ 74,500.00

Return on Capital, about 17%.

The profit of $12,000.00 does not take into account any costs of leasing land, sea-bottom, etc. nor the cost of marketing the sponges. The time and cost of supervision and of training laborers is also omitted.

It must be emphasize that the above estimates are based upon an assumed efficiency of operation that is only realized when the location is ideal. The cost of labor might well be doubled if considerable weed growth occurred on the sponges, necessitating frequent cleaning by hand, or if the bottom was subject to heavy wave action which might cause the discs to become overturned or the sponges to become buried. It is also to be note that while disasters of the type of the 1939 mortality are very infrequent they are nevertheless a matter of record. It is, therefore, felt that preliminary experimentation should be carried out in the Florida Keys by governmental agencies and a model sponge farm set up. This would also make it possible to bring restocking of depleted beds. The recovery of the natural beds in the vicinity of the sponge farms at Andross Island, in the Bahamas, showed the importance of having breeding sponges in a situation where water currents may bring about dispersal.

The cost of a government experimental project for sponge cultivation is estimated as follows:

Annual Costs of Five Year Sponge Cultivation Project

Chief biologist	$ 6,000.00
Assistant biologist	3,500.00
Assistant chemist	3,500.00
Labor	7,000.00
Boat operation and maintenance	5,000.00
Supplies and equipment	3,000.00
Boats and shed (Initial cost spread over 5 years)	5,000.00

Material for discs, rafts, etc.	2,000.00
Total	$ 35,000.00

OBJECTIVES OF THE PROJECT

1. Set up practical model sponge farm.
2. Develop economically feasible methods.
3. Develop specially fast-growing and resistant strains of sponges.
4. Re-seed the depleted beds of the Keys and Gulf fisheries.
5. Study sponge diseases, life history, etc.
6. Study requirements for optimum growth and texture of cultivated sponges by transplantation methods.
7. Study possibilities for commercial utilization of hitherto worthless sponges varieties.