

ABSTRACT

The feasibility of restoring G. debilis as a commercial enterprise in Barbados was determined by experiments in tanks and on stakes and rafts at sea. Numerous sub-set studies elucidated cause-effect relationships between physiological-environmental factors and plant growth rates and others investigated nutrient uptake kinetics and the nutrient value of the dried alga.

Overharvesting, water degradation and the low growth rate of G. debilis are responsible for the depletion of wild stocks. Prospects for culture are reasonable only on rafts at Bath (east coast) and off the South Point, where some natural stocks persist, since poor water quality, wave action and the topography of the coasts eliminates farming prospects in many sections of the maritime circumference. Stake culture is not suitable, possibly because it combines the worst of the natural and artificial conditions; and the propagation in tanks will only be possible with good quality water, regulated light intensities and high water-turn-over rates.

Best culture method for G. debilis is by vegetative propagation on polypropylene ropes (0.50cm, 1.00cm) at depths of 10.0cm - 70.0cm at sea. Mean specific growth rates at Bath were 1 - 2%/dy; some plants reached 4%/dy. With a cropping time of 57 days, predicted yields

from a raft-rope ladder system are about 10,273 kg dry seaweed/ha/yr but may be increased by strain selection and nutrification. Expected profits from a 0.05 ha farm are \$9,600 BDS/yr.

Plant growth was positively affected by nutrification and light intensities up to a certain level, adversely affected by water turbidity and not affected by plant region used, starter weight, branch apex number, stocking density below a certain level on ropes at sea or the determined epiphyte loads on the plants. Nutrient uptake, specifically phosphate-phosphorous uptake kinetics, did not exhibit saturation kinetics and the nutritional value of the seaweed lies in its mineral content.