

CDR Project No. C5-222

AID-CDR Grant No. 936-5544-G-00-6033-00

**Strain Selection of Spirulina Alga  
Suitable for Mass Production**

Interim Report No. 5

by

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## Outdoor performance of algal strains

### 1. Effect of mixing and cell concentration on productivity and photoinhibition.

In many studies in the past, we have pointed out the important role of photoinhibition as a limiting factor for biomass production. As a first step toward optimization of algal biomass production, a relatively stable strain was tested under outdoor conditions. In Table 1, the results of the interaction between cell concentrations and mixing are summarized. It points out the possibility of reducing the photoinhibitory effect by increasing cell concentration. Furthermore, by increasing rate of mixing, the overall productivity can be increased.

Table 1: The effect of cell concentration and mixing on photoinhibition and productivity

Mixing rate	Cell concentration (klett units)	Inhibition (%)	Output (dry weight (g m <sup>-2</sup> d <sup>-1</sup> ))
20 RPM	250	13	15.2
	150	21	14.8
12 RPM	250	12	12.3
	150	21	12.1

## 2. Strain performance under different harvesting regions

One of the most important operational factors in algal mass production is the frequency in which the cultures are harvested and the effect of harvesting on the culture growth. 6 strains were tested in two harvesting regions as indicated in Table 2. This experiment was carried out in NIFI collecting daily parameters such as temperature, pH 0, etc. The results are summarized in Table 3, pointing out that for all strains a more frequent harvest resulted in a higher output rate, where the strains TH-S-0 had the high production rate.

Table 2: Effects of harvesting intervals on the daily output rate (in g m<sup>-2</sup> d<sup>-1</sup>)

STRAINS	HARVESTING INTERVAL	
	(6ds)	(3ds)
TH-S-02	POND #1	POND #2
TH-S-04	#5	#10
TH-S-06	#3	#4
TH-S-08	#9	#8
TH-S-09	#7	#8

Table 3:

Strain	6ds	3ds
TH-S-02	11.13	14.27
TH-S-04	10.18	13.53
TH-S-06	10.15	12.70
TH-S-07	12.50	12.20
TH-S-09	11.13	12.23

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