KIKO TECHNOLOGY ROSENBERGI SHRIMP NURSERY TRIAL– ZHONG SHAN, PR CHINA

TRIAL PARTNER	Zhong Shan Shrimp Nursery
LOCATION	Zhong Shan City, PR China
SPEICE	Rosenbergi shrimp
PROJECT COORDINATORS	Mr. Steven See, Kiko Technology Limited Mr Fung Han-Kwong, Nursery Owner
DATE STARTED	5 March 2012
DATE ENDED	27 March 2012
OBJECTIVE	To reduce mortality in Rosenbergi shrimp nursery from Nauplius to Post larvae - juvenile at 23 days growth stage.
PROCEDURES	The beta trial will be conducted employing a Control nursery (no Kiko) vs. a Test nursery (using Kiko). In the test tank holding 09 CBM, two (2) Tritan cartridges were suspended is the determined dosage. All other factors should be kept the same to establish a true test vs. control. Back Ground on Mother Shrimp: The nursery purchases eggs from a hatching farm in Dongmun township in Guandong province. The mother shrimp lays about 12,000–15,000 eggs at a time. One male shrimp is used to mate a ratio of three (3) females. The Dongmun source is located approx. one hour by car from the Zhong shan trial site. In future, KTL will consider applying the technology in the spawning phase as farmers said only 85% of eggs laid, actually hatch to Nauplius. The objective in this trial is however, to observe the morality rate from Nauplius to Post Larvae-juvenile stage. Shrimp eggs are laid at the size of a needle tip and farmed in closed, heated, concrete tanks. Within 23 days, eggs hatch to post larvae grow to about 0.8–1.0 cm. The mortality rate in this 23-day period, a well-managed nursery in this region is between 25% to 30%.For other sluggishly managed nursery, mortality rates as high as 70% or totally wiped out is not uncommon. Larvae are fed a diet of boiled eggs mixed with freshly hatched Artemia Cysts (Brine Shrimp). This nursery farm has ten (10) breeding tanks and uses 2.5 kg (or: 5 catties) of feed, five (5) times a day, per tank. GROWTH TANKS: Each of the 10 tanks measures $9m^2$ (square meters) and 1m high, so we would assume 9 tons of water or $9m^3$ (cubic meters) per tank. There are also two (2) additional tanks at a slightly bigger capacity of $15m^3$ each. Dosage for the trial (based on water volume) has been determined at two (2) Tritan cartridges per tank In the beta trial, which determines cost and performance benchmarks for the anticipated service contract, only one of the 10 tanks will be isolated for the test (i.e. the beta phase requires 2 KCC only). In this beta phase, all other tanks will serve as the control as they should be reflective of the norm. NURSERY TANK WATER: The breeding water is a combination of seawater (collected near the oceanic regions between Macau & Hong Kong, importing at a cost of RMB ¥10 per cubic meter (m^3) & mixes with fresh underground water to a brine concentration of about 10%. This water is constantly heated by steel tubing/piping under each tank to a temperature of 33°C. pH is about 8.2, due to ammonium wastes discharged by the larvae. (*It is the opinion of KTL that this pH level could vary as the juveniles grow and discharge more waste.)* The whole metamorphosis takes average 23 days to reach juveniles stage before being sold to other shrimp farms to grow out for another four (4) months in an open air pond until the shrimps mature to full marketable size. TANK MAINTAINENCE: As mentioned, Nauplius grows to juvenile size in 23 days for harvest in one cycle. Each $9m^3$ tank houses about 1,000,000 Nauplius. The nursery does not have a policy to check the ammonia concentration in tanks & only

assumes such level remains constant.

The bottom of each tank is cleaned daily by scraping with a squeegee to remove eggshells and ammonium wastes. Water/brine composition and temperature are key factors in survival, thus, the room is completely sealed off, and intake air is pumped in through an underground piping system.

Nauplius larvae at 6 days old

RESULT

Post larvae/Juvenile mortality rate on 23rd days :

Control : 40 % Kiko: 21 %

COMMERCIAL IMPLICATION

Current 23 days old post larvae farm gate price: RMB 350 per every 10,000.

Working on 20% improvement in mortality rate after treated by Kiko:

One Tank		Across 10 Tanks	
No.of larvae at start:	1,000,000	No.of larvae at start:	10,000,000
Reduction in Mortality %:	20 %	Reduction in Mortality %:	20%
Extra larvae survival :	200,000	Extra larvae survival :	2,000,000
Extra income per cycle	RMB 7,000	Extra income per cycle	RMB 70,000

Working on average 9 nursing cycles per year with 5 tanks in each cycle, shrimp nursery can easily achieve extra income of over RMB 300,000 annually after adopting Kiko Technology treatment.

Submitted by :

簽名/蓋章 馮汉光

2 April 2012

Translation assisted by Kiko Technology