EM APPLICATION TO FLAT FISH BREEDING

Reported by Jinshou Nishime,
Director Iheya Fishermen's Cooperative

Introduction:

Iheya Island is the Northern most island of the Ryukyu Islands, approximately 100 km north of Okinawa.

Iheya Fishermen's Cooperative has been looking into new ways to revitalize fishing industry, and to improve and stabilize level of living for fishermen of Iheya Island. One of such efforts was flat fish breeding on land. Flat fish was selected because it is fairly well priced and not in competition because the most commonly bred fish in Okinawa Islands is red sea bream. On-land breeding was preferred to avoid typhoon damages although it is more costly than in-sea breeding. It is also easier to control hygienic condition of breeding facility. On-land breeding was made possible because underground cooler sea water was available in Iheya island. Flat fish live in temperate water, and warm tropical sea water of Okinawa Islands is not preferable for flat fish.

In the beginning, chemical drugs were used to suppress diseases and other problems. Abundant use of disinfectant and antibiotics made it possible to suppress diseases, but did not make fish appetizing to me. I was looking for alternative safe ways. That is when I recalled EM; what Dr. Higa talked in his lecture and what EM farmers and retailers told me, and I decided to apply EM in flat fish breeding.

EM application made a magic to happen, unbearable foul odor was eliminated, and accumulated sledge was reduced. The most remarkable was that fish became healthier, therefore, chemical drugs were no longer necessary.

This was the first successful ease of on-land fish breeding in Okinawa prefeture, and opened up a good future for on-land fish breeding with EM application. I tike to expand the facility to breed 60,000 heads of fish from the current 16,000 to serve as a model facility for those interested.

The Current Status of Fishing Industry in Okinawa:

Fishing in Okinawa prefecture is not growing much. Nether is breeding sea weeds and shrimps. Recently, deep sea fishery and offshore fishery are declining, and coastal fishery including in-sea breeding is becoming more active.

Fishing industry has many problems; reduced resources, lack of and aging of workers, pollution of fishing grounds due to washed out soil, increased competition with imports, and low market price. Therefore, expectation is high with breeding which allows some control over plans to provide stable income, and breeding has been expanded to include two kinds of sea weeds, several kinds of fish, such as, red sea bream, yellow jack, yellowtail, tuna, grouper, and three kinds of shells.

Flat Fish Selected for Breeding

Sea water breeding in Okinawa centers around shrimp and red sea bream. Breeding the same kinds will not be wise; therefore, breeding flat fish was selected in November 1993. Flat fish was formerly considered impossible to breed in Okinawa.

Initial Breeding Plan

Volume	2,500 heads
Method	Circulation method
Tank	5 tanks of 5.5 tons each
Water required	6.6 tons/day

Problems

Underground sea water was used to maintain control over hygienic condition of the tanks. But in two months, diseases started spreading, and in three months, foul odor started. These problems were treated by increasing the amount of water, disinfectant, and antibiotics.

Introduction of EM

I recalled what Dr. Higa said in his lecture, what EM retailers and farmers said about EM. I thought that EM may be able to resolve the problems that we had. We could get some control over diseases by giving large amount of drugs to fish, but that only creates more problems in the long run. EM resolves such problems. EM will breed healthy flat fish that we can be proud of.

EM Application

Ten litters of EM #1 and #4 were added to 28 tons of water. EM was sprayed over the feed.

EM Effect

Elimination of foul odor

Workers used to complain foul odor that the odor causes headache and nausea. EM application reduced foul odor so much that only a faint smell is detected.

Reduction of diseases

Mycoplasma infection and white spot disease used to spread to all tanks. EM application reduced the occurrence of such infections; it happens only once or twice and only in a few tanks.

Reduction of death rate

The number of fry death was reduced greatly. Most of hatched fish will grow to adult fish.

Reduction of water

EM application reduced sludge accumulation in tanks; thus, the amount of water required was reduced to 2/3 of what it used to be, which means that the facility is capable of breeding more fish than what was originally planned.

Reduced use of drugs

Fish disease is very contagious, and it spreads to all tanks very easily. When a disease occurs, it usually kills all fish in the breeding facility. Before starting again, all tanks must be

disinfected. EM application reduced occurrence of fish diseases, and use of antibiotics was limited to the minimum. A disease happens only once a year and only in a few tanks, and use of disinfectant is also minimum.

Reduced costs

Drugs for one year used to cost us approximately JPY 75,000/tank. EM application costs us only JPY 33,000/tank, and it will be further reduced to 1/3 because we now use extended EM.

Future Prospectus

This was the first ease of successful on-land fish breeding in Okinawa, and it was made possible by use of EM. Although there are still some problems in Okinawa fishing industry, the success opened up a door to on-land fish breeding, which insures less damage by typhoon than in-sea breeding. We plan to expand the facility to breed 60,000 heads from the current 16,000 heads. The new breeding facility will have a showcase for those who are interested in EM and fish breeding.