

OVERVIEW OF THE INDUSTRY

Assessment and Recommendations

Five papers on five distinct components of the industry were presented by authorities on the field covered by the component. The areas reviewed are (1) seed production, (2) culture, (3) feed development, (4) processing and exporting, and (5) government policies. Presented below are the summaries and the recommendations that were generated from the papers and the discussions that followed.

SEED PRODUCTION

The paper described the state-of-the-art in prawn hatchery technology and wild fry collection in the country. The major species for culture emphasized is *Penaeus monodon* Fabricius locally named as *pansat*, *lukon* or *sugpo*. It is currently the predominant species for pond culture and export. Technical and non-technical problems were brought up and possible solutions recommended. Also provided was an updated list of penaeid prawn hatcheries in the Philippines.

A brief assessment of the natural production cycles of sugpo as well as its artificial propagation provided background information on culture and production. The history and classification of existing hatcheries in the country were presented including primary considerations in establishing a hatchery. Part of the considerations are the technologies that have been generated by research institutions like the SEAFDEC Aquaculture Department and Mindanao State University Institute of Fisheries Research and Development and the private sector.

In the workshop session on seed production, problems that were identified were mainly on spawner supply, larval rearing, nursery, wild fry collection, transportation, and manpower shortage. Discussed were the following concerns:

1. Availability of wild spawners

Inquiry was made from private hatchery owners as to identification of the spawner sources. From ecological studies and from analysis of fishing trawl catches, some have already been identified in the Panay area, places like Miag-ao, Villa, Binun-an, Estancia and Concepcion in Iloilo, Casanayan

in Capiz, and Makato in Aklan. SEAFDEC has indirectly identified good collecting sites for spawners.

It was observed that there seem to be no spawners during particular months. The explanation was offered that perhaps no efforts are exerted to collect during certain periods for some reasons like inclement weather, although spawners may always be available.

A participant from San Miguel Corporation mentioned that spawner quality, not availability, is the problem. For certain months of the year, spawners lay high quality eggs with high survival rates, as experienced by many hatcheries in the Philippines. In other months, egg quality becomes so poor as to cause production to drop.

In the Southern Philippines Development Authority hatchery, collection of spawners has not been a problem. However, they collect only during full moon when they can be sure of catching good quality spawners.

The suggestion was to forge a good working relation between those in capture fisheries and the hatchery people. It was cited, for instance, that in Thailand spawners collected by fishermen are sold to hatcheries. Such cooperation could greatly benefit our own prawn industry. A few years back, trawlers stopped operating in the area so that this particular source for experiment broodstock has dried up.

The need was realized for data monitoring among hatcheries so that researchers and operators can share in the analysis and resolution of common problems.

Control of spawner movement should be done by licensing not by banning, because the latter does not seem to always work. Exporting spawners is a profitable enterprise. It is attractive, legal restrictions notwithstanding, for people to engage in it.

At present, there are two sources of spawner supply: wild and pond broodstock. Relying solely on wild supply does not solve the problem of unpredictability and inconsistency of supply. The use of pond-reared broodstock can be a solution. However, there is an age requirement for spawners—about 10 months old—which is not always readily satisfied by pond-reared sources. Moreover, hatchery operators tend to believe that quality of fry from pond-reared broodstock is poorer than that from wild spawners.

2. Pond-reared broodstock

A participant from the San Miguel Corporation cited his experience with pond-reared broodstock: 30 g females were reared with commercial feeds in 1 m tanks; the good ones were selected and fed with clams and mussels until they reached 100 g. However, not much success was achieved using this approach.

At the Masaganang Sakahan, Inc. (MSI) project in Mindoro Occidental, they use broodstock tanks, similar to those of SEAFDEC, covered with black cloth. Females weighing 100 g and males weighing 60 g are selected, treated with 10-20 ppm tetracycline, and then ablated. Production average

is two (2) million nauplii per day.

3. Larval rearing

Water quality in the hatchery changes with the season because certain species of diatoms are not produced throughout the year. However, it is possible to have pure cultures of diatom all-year round. With regards to other trace elements, some hatcheries use chelating agents to bind harmful ions in the water. The effects of heavy rain on algal cultures can be avoided by maintaining them indoors. The problem in hatchery may be related to spawner quality, not heavy metal contamination. It may be also related with shrimp or prawn quality because its occurrence appears to be countrywide. For example, whenever the SMC hatchery has a good production of postlarvae, catch of fry from the wild is also high.

A reservoir is helpful in the operation of a hatchery, it was emphasized. Bacterial content and variety are reduced in water that is stored over a longer period.

4. Feeding

The SEAFDEC Aquaculture Department is at present conducting experiments using micro-encapsulated diets in feeding prawn larvae. Preliminary results suggest that the diet is more suited for *P. indicus* than for *P. monodon*. Further refinement is being made to suit the diet for *P. monodon*. A great possibility exists for these micro-encapsulated diets to take the place of algae. An ongoing experiment incorporates micro-encapsulated diets in *Artemia*.

5. Diseases

The SEAFDEC Aquaculture Department is in the process of identifying the causes of different diseases of prawn larvae. Results of studies are being disseminated through publications and training programs.

6. Nursery

At the Department, studies on the culture of postlarvae in nursery have been conducted. Pellets were fed to postlarvae at 10-20% biomass. However, this was found low for PL₅. Therefore, 50% of the biomass as the maximum level was recommended. As the postlarvae grow the feeding rate should be correspondingly reduced.

The satiation method was also suggested to determine optimum feeding level. This is done by feeding about 10-20% biomass and then looking for leftovers after a few hours. Appropriate amounts may be added or decreased depending on whether or not there are leftover feeds.

The optimum stage at which postlarvae may be harvested from the nursery for stocking in ponds could be determined in terms of economics;

while postlarvae may have low survival in ponds they are cheaper. Thus, a trade-off should be established between survival and cost of production inputs in the pond.

Aside from concrete tanks, plastic-lined tanks can be used in hatcheries. Effectiveness of hapa nets for nursery has also been demonstrated, using a density of 20,000 - 30,000 in 10 m³, producing an approximate survival rate of about 70% from PL₅ to PL₃₀.

7. Wild fry collection

A training program on fry identification, collection, and transport is being conducted by the AQD. It was felt that definite figures on wild fry collection be made available to the private sector, including baseline data, to properly assess fry resources.

8. Transport and handling

In general, method of transport depends on how long it takes to transport and the number of fry. The fry depends on oxygen dissolved in the water and the level should be kept above the minimum needed for survival. Reduction in temperature is beneficial because it lowers oxygen consumption due to lowering of metabolic rates.

The effectivity of transport and handling also depends on the schedule of commercial flights. Private planes may be convenient but the volume to be transported should be as large as possible to keep down unit cost.

9. Manpower

It was generally felt that technicians who have the right attitude can manage hatcheries. Teamwork is the secret of a successful hatchery operation. The need to upgrade the competence of technicians from time to time through training programs was felt.

It was suggested that the private sector and the training institutions collaborate to institute a workable program designed to ensure the quality of hatchery technicians.

It was suggested that for technicians to develop a more positive attitude towards their work, better incentives should be given them like promotion, holidays with pay, transportation allowances and other fringe benefits.

Finally, the workshop distilled the recommendations into the following:

1. For research directions: studies be conducted on the husbandry of broodstock particularly on feeding management; substitutes for expensive feed items like *Artemia* and formulation of alternative feeds using sources which do not compete with human food supply.
2. For industry support: financial support be given by the private sector in collaboration with the fishfarmers by funding studies relevant to their own local conditions and/or done in their locality.