

Islands, the Federated States of Micronesia, the Republic of Palau and the Republic of the Marshall Islands. While in that post, Haws conducted a highly successful pearl oyster culture workshop.

In July 1997, Haws and Ellis travelled to the Marshall Islands to conduct a series of short demonstrations and informal discussions for farmers on a variety of topics, including pearl oyster biology and culture, reproduction, spat collection, oyster seeding, pathology, disease prevention, pearl production, farm engineering and farm economics.

While in the regional extension position, Haws wrote a pearl oyster culture manual. She noted a number of problems that farmers may face when culturing pearl oysters and suggested possible solutions.

One problem, common to farmers culturing almost all species, is a lack of reliable local source of stock. Haws commented that collection of pearl oyster spat forms the major obstacle to establishing a pearl oyster industry in Micronesia. She suggested that a possible solution would be regular collection of spat from areas where pearl oysters are naturally abundant. These spat would be best farmed in the same area. Transferring the spat incurs the risk of introducing disease and genetically swamping local

strains. These risks can be minimised by developing transfer guidelines and training farmers in proper transport methods.

In addition, Haws said that keeping the oysters clean is important to their health, but novice farmers may spend too much time cleaning the animals, which increases farm labour costs. One solution is to adopt Tahitian methods and farm designs to increase efficiency and streamline all farm operations.

Haws noted that pearl oyster planting lines must be submerged deeply enough so that they are not moved by wind and wave action, which could shake the oysters off the line or negatively affect their feeding and growth. For that reason, farms must have trained SCUBA divers who can work on the stock.

Finally, she observed that the pearl oyster culture industry in Micronesia will require continuous technical assistance to become well established. The regional aquaculture extension specialist can make only four to five annual trips to each locale. To fill the gaps between his visits, Haws suggested that one or more local extension agents be hired, perhaps with funding from the Asian Development Bank or some other donor.



Observations on the impact of the installation of a pearl farm in Guaymas, Sonora, Mexico

by Enrique Arizmendi

Enrique Arizmendi, from Perlas de Guaymas, makes the following observations:

- a. There has been an increase in the number of spat collected per bag for two consecutive years, both for *Pteria sterna* and for *Pinctada mazatlanica*, as our farm size has increased from research to pilot to commercial. We think this is the logical result of an important increase in the fertilisation rates of these pearl oysters.
- b. Seed collection results in a re-use, not an extraction, of the organisms. We do seed collection and culture in the same bay and the pearl oysters stay with us for about four years, during which time they develop as fully mature adults and spawn several times before harvest. We don't know the survival rates from pearl oyster larvae to fully mature adults in the natural process but in culture it is about 80%. This is incredibly higher than the rate that can be deduced from observations on the number of adults in the natural beds (a few thousand) and of the larvae present (we can collect up to 600 *Pteria sterna* spat per bag).
- c. Our collection and culture structures are working as artificial reefs for a great number of species. The Sonoran coast is very productive, but here at 28°N, there is a lack of suitable niches because there are no coral reefs, and rocky reefs are limited to the shoreline.
- d. We have kept broodstock with the best traits for several years in the best conditions. The quality of these organisms for breeding is unsurpassable.
- e. We, as the pearl industry leaders, agree with research groups in promoting the preservation of the natural pearl beds (the wild organisms) of both species of pearl oysters.

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