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Quo vadis, shrimp?

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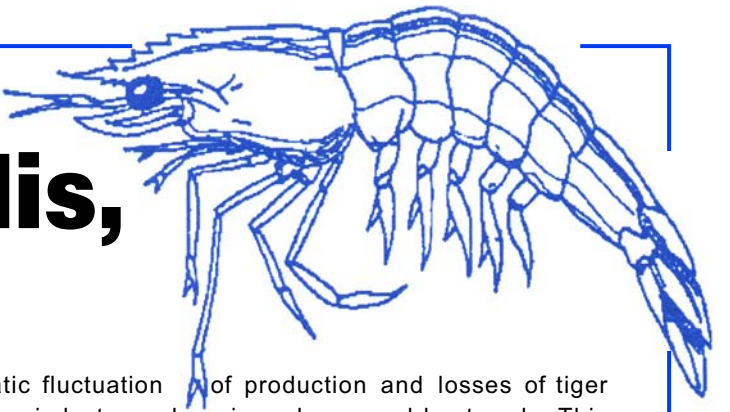
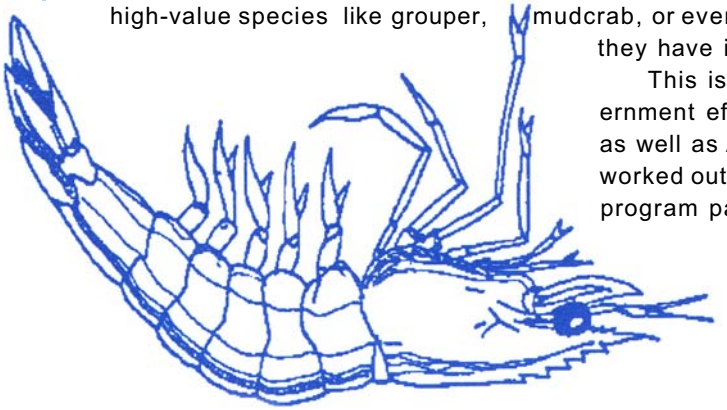


Quo vadis, shrimp?

Where to, tiger shrimp? The dramatic fluctuation of production and losses of tiger shrimp in the Asia-Pacific indicates an industry undergoing a boom-and-bust cycle. This is widely attributed to disease outbreaks linked to environmental deterioration, and questions about the industry's sustainability have been raised.

But in itself, shrimp culture is a very good business. Worldwide demand, for instance, has shown consistent growth of 2.5% per year which experts say can last well into the 21st century. In which case, there's no stopping profit-motivated farmers from going intensive as environmentalists fear. Shrimp farmers, however, can be convinced to totally change the way they run their farms, and to incorporate environment-friendly methods. Production losses from diseases brought about by deteriorating water quality may be reason enough. The industry needs to consider that shrimp farming is a part of a bigger ecosystem.

This issue presents the shrimp production trends in Asia-Pacific, along with notes on the diseases devastating the industry and interviews with shrimp farmers in the Philippines. The options of shrimp farmers -- which are really quite limited and largely experimental - are discussed. These options include probiotics, the use of beta-glucans as immunostimulant, closed recycling systems. Farmers may also opt to farm other high-value species like grouper, mudcrab, or even milkfish to make use of the ponds they have invested quite a lot on.



This issue also discusses Philippine government efforts to revive the shrimp industry, as well as AQD's R&D priorities for shrimp as worked out in various consultations with AQD's program partners and industry practitioners.

Production trends

FIGURES REPRESENT VARIANCE IN 1994 AND 1995 SHRIMP (HEAD-ON) PRODUCTION
(FROM *ASIAN SHRIMP NEWS,* 4TH QTR 1995)

world cultured shrimp production (tons): 1993-1995

	1993	*1994*	*1995*	*variance '95/'94*
Thailand	209,000	250,000	270,000	+ 20,000
Ecuador	76,000	100,000	100,000	no change
Indonesia	100,000	100,000	80,000	- 20,000
China	30,000	35,000	70,000	+ 35,000
India	55,000	70,000	60,000	- 10,000
Vietnam	40,000	50,000	50,000	no change
Bangladesh	30,000	35,000	30,000	- 5,000
Taiwan	20,000	25,000	30,000	+ 5,000
Philippines	25,000	30,000	20,000	- 10,000
Mexico	9,000	12,000	12,000	no change
Others	45,000	51,000	40,000	- 11,000

In 1995, almost every shrimp producing country suffered from disease outbreaks which resulted in substantial mortalities. Thailand remained the undisputed leader for the fifth consecutive year (see map and table).

White spot disease outbreaks reduced Thailand's 1995 first quarter production by 9%. But subsequent quarters helped finish the year with an overall 8% growth over 1994.

Map by E. Ledesma

Thailand: lessons from the top producer

Thailand is favorable to shrimp culture because of climate (soil and water conditions), availability of wild broodstock, long traditional experience in aquaculture, seafood processing and trade, good infrastructure and transport, and locally produced equipment. Thailand has become the top producer of cultured shrimp by adopting the intensive culture system in 1991. During the disastrous 1993 shrimp crops in China and Indonesia, Thailand was able to increase its production to nearly 170,000 metric tons to make up for the shortfall in world supply. The sharp increase in shrimp prices in 1993, driven mainly by the high demand in the world market, spurred shrimp farmers to further boost their production. After lengthy experience, shrimp farmers have adapted culture techniques and feed formulations to their farm conditions. These techniques include the use of reservoirs for better waste management, utilization of undiluted seawater for culture, low-cost pumping systems, measures to neutralize acid sulfate soils, proper treatment of pond bottom, and solutions to disease problems. Thailand's improved technology has incorporated environment-friendly features based on previous experiences of farm pollu-

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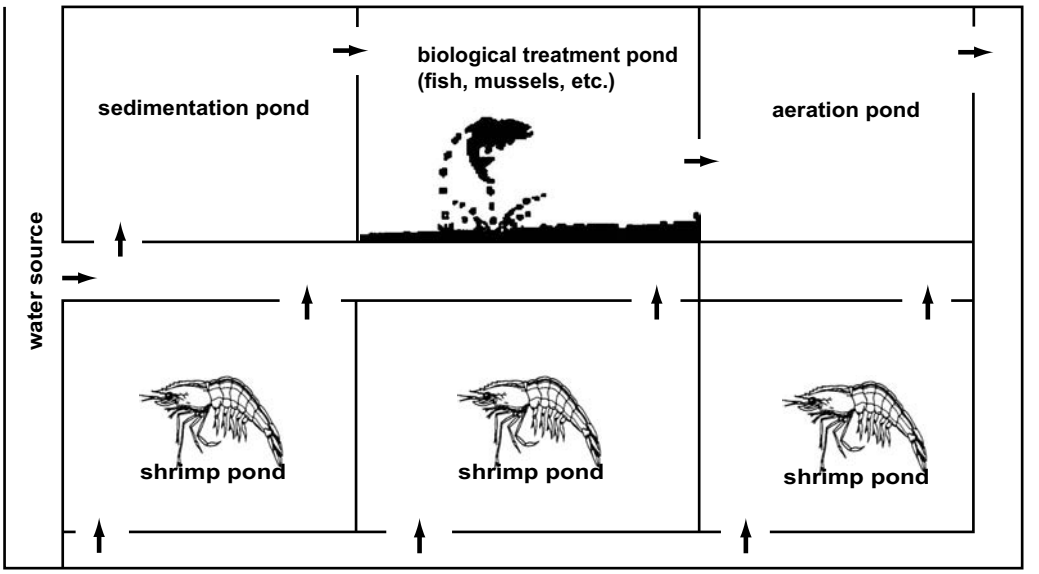
tion and diseases caused by mismanagement and wrong site selection. The Thai tradition and the long-standing government practice of seeding water resources with fish and shrimp fry on auspicious days have helped solve the shortage of broodstock in hatcheries. Efficient hatcheries and high production of small-scale grow-out farms enable the shrimp business to survive in an increasingly competitive environment. Most shrimp farmers prefer to develop ponds in non-tidal areas for several reasons: (1) to avoid the high costs of mangrove clearance and problems arising from peaty and acid sulfate soils; (2) to save on pond construction costs by the use of heavy machines; (3) to completely dry or remove the pond bottom layer; and (4) to use the land as collateral for bank loans.

Finally, the Thai government has issued several rules and regulations and established various projects to study or demonstrate practices compatible with environmental protection. One is the requirement for farms with areas exceeding 8 ha to construct a wastewater oxidation pond (see figure). Another is limiting effluent biochemical demand at 10 ppm.

Schematic of a water recycling system used for intensive shrimp culture in Thailand and Indonesia. The scheme is similar to a simplified version of domestic waste treatment, which includes sedimentation ponds, biological treatment - detritus and/or plankton feeding fish like mullet and milkfish and molluscs such as mussels and oysters -- and aeration. The treated water is stored in a reservoir pond and returned to shrimp grow-out ponds (Lin, 1995). An example of a closed water recycle farm is found on page 18, this issue.



In the closed system, clean water during the highest tide is introduced into the grow-out ponds and the reservoir only once; at the beginning of the culture cycle. Water in the reservoir is gradually added to fill the grow-out pond until there is no water left. Later, the wastewater from the grow-out pond is gradually pumped back to this reservoir, which will now serve as sedimentation pond. Organic loads and silt will settle while living organisms such as phyto- and zooplankton will be consumed by fish and molluscs (the so-called biofilters) in the biotreatment pond. The clear surface water is allowed to overflow to an aeration pond or canal. This recycled water is pumped back into the grow-out pond.

Wastewater is pumped out of the grow-out ponds not on the first month but on the second and third months (about 20% every 3 days; increased to 30% on the final month). However, it is best to monitor ammonia and salinity levels in the grow-out ponds (not to exceed 0.1 ppm and 40 ppt, respectively). Water released to rivers or canals is disinfected by 300 kg per ha of chlorine.

SOURCES: (1) A year in review: 1995 shrimp production. *Asian Shrimp News* 4th qtr 1995, no. 4 published by the Asian Shrimp Culture Council. (2) C Kwei Lin. 1995. *Progression of Intensive marine shrimp culture In Thailand.* In: CL Browdy and J Stephen Hopkins, eds. **Swimming through troubled water**; Proceedings of the special session on shrimp farming. 1-4 February 1995, San Diego, California.