

2016

Giant freshwater prawn hatchery and grow-out

Aquaculture Department, Southeast Asian Fisheries Development Center

SEAFDEC Aquaculture Department. (2016). Giant freshwater prawn hatchery and grow-out [Brochure]. Tigbauan, Iloilo, Philippines: Author.

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Is **GIANT FRESHWATER PRAWN** profitable?

Technical information for seed production

Item	
Project duration	5 yrs
No. of broodstock (F=700, M=140; assuming ave. size of females is 30 g)	840
Survival rate (larval rearing)	40-60%
No. of days/run	45
Survival rate of PL (nursery)	70%
Production/60 days	700,000 pcs
Number of runs/year	4
Farm gate price (PL 15)	PhP1.00

Technical assumptions for grow-out (1 ha farm)

Item	
Project duration	5 yrs
Total effective pond/cage area	8,000 sqm
Stocking density	15 pcs/m ²
Cost of post-larvae	PHP1.00
Crops per year	2
Ave. weight at harvest	30 g
Recovery at harvest	75%
Total number of stock/crop	120,000
Total recovery at harvest/crop	90,000
Total weight at harvest/crop	2,700 kg

Cost and return analysis (PhP per year)

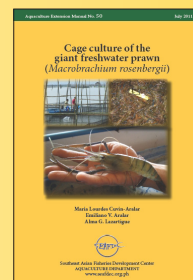
	Pond	Cage
Gross sales	1,350,000	1,350,000
Variable costs	726,000	719,000
Fixed costs	263,000	342,000
Total cost	989,000	1,061,000

Economic Indicators

Item	Pond	Cage
Net income	PHP 361,000	PHP 289,000
ROI	110%	76%
Payback period	0.80 yrs	1.0 yrs
Break-even price	PHP 146	PHP 157
Break-even production	4,947 pcs	5,305 pcs

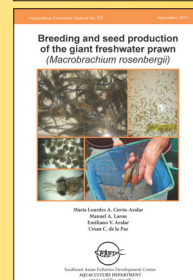
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AEM 52 Breeding and seed production of the giant freshwater prawn (*Macrobrachium rosenbergii*) Maria Lourdes Cuvin-Aralar et al. (2011)

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GIANT FRESHWATER PRAWN Hatchery and Grow-out



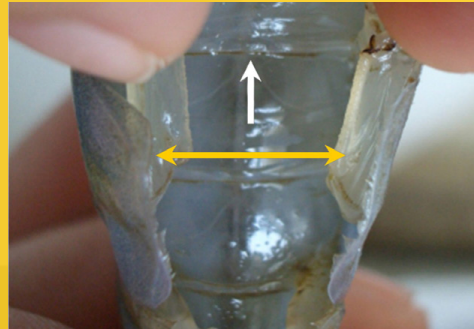
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Why GIANT FRESHWATER PRAWN?

Giant freshwater prawns live in freshwater environments but berried females migrate downstream to brackishwater where the eggs hatch into larvae. Ideal salinity of brackishwater for larvae to survive is 12 ppt. These crustaceans are common in the tropical and sub-tropical waters of the Indo-Pacific region and are reported to grow to a length of 25.5 cm. Based on breeding trials, they take at least six months to mature.



Mature male-presence of protrusion in the ventral part of the first abdominal segment (white arrow) and distance between the covering of the abdomen is narrow (yellow arrow)

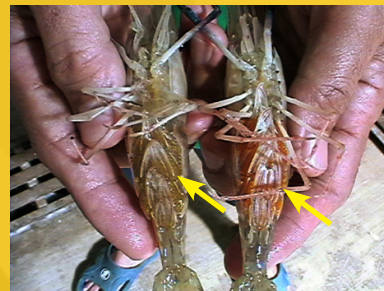


Mature female-absence of protrusion and distance between the covering of the abdomen is wider by about a third to double that of the male of the same size (yellow arrow)

How to culture GIANT FRESHWATER PRAWN?

Broodstock management

- Broodstock are stocked at about 4:1 female-male ratio. Blue- and orange-clawed males are preferred since these males are bigger and are able to mate more efficiently than smaller males.
- Orange eggs of berried females will take about 3 weeks to hatch while grayish or brownish eggs will hatch in 2 to 3 days, usually at midnight to early morning.



Brownish (left) and orange eggs (right)

Larval rearing

- Larval rearing tanks may be made of fiberglass, polyethylene, or concrete. Water with a salinity of 12 ppt is used and stocking density is 50-100 larvae/L.
- Total standing water volume at any given time to produce 700,000 post larvae (PL) from 2.5 million stage I larvae is 50 tons excluding water change. Allocate 150 m² area for the tanks and other hatchery facilities. This is using the lower limit of stocking density at 50 larvae/m².
- Larvae are fed brine shrimp nauplii, egg custard (solidified egg emulsion), and *Moina* sp.
- Water quality is maintained at pH=7.2-8.5, dissolved oxygen (DO)>3 ppm, temp=28-31°C, ammonia<0.1 ppm.
- The larvae undergo several stages of development before they metamorphose to PL in 28-35 days depending on temperature, nutrition, and other factors.



Polyethylene (left) and fiberglass (right) larval rearing tanks. Larval rearing tanks can range from 100 L capacity to several tons, depending on capacity and target production.

Nursery

- Primary nursery range is 15 to 30 days; Secondary nursery to produce juveniles is up to 60 days.
- The larvae metamorphose to PL and are acclimated to freshwater.
- PL are reared in nursery tanks, ponds, or lake-based hapa net cages and fed commercial feeds at 10-20% of body weight.
- Fifteen-day old PL (PL 15) and older are ready for grow-out.

Stocking density for nursery*

Ponds	1,000 PL/m ² no aeration and substrates
	2,000 PL/m ² with aeration and substrates
Tanks	1,000 PL/m ² without substrates
	2,000 PL/m ² with substrates
Cages	1,000 PL/m ²

Grow-out

- Procure quality prawn PL from a reputable hatchery or supplier [*PL are available at AQD's Binangonan Freshwater Station*]. Ensure minimal transport stress to PL.
- Stock PL 15 depending on the culture system to be used. Higher stocking densities could result in smaller prawns at harvest. Cage size varies from 25-200 m² submerged at 1m depth.
- Provide submerged feeding trays for prawns cultured in cages. Formulated diets for shrimp or fish may be used.
- In both pond and cage culture, stock management could be by batch system (waiting until prawns reach average marketable sizes), or cull-harvest system where marketable size are periodically culled out before one final harvest of the stocks.
- In ponds, use shelters/substrates to increase pond surface area, improve survival of molting prawns, and allow for higher stocking densities.
- Prawns reach marketable size in 4 to 5 months. Mean size at harvest is 25-35 grams. Longer culture period may be required for higher stocking densities.

Stocking density for grow-out

Culture system	Density
Extensive	1-4 PL/m ²
Semi-intensive	5-20 PL/m ²
Intensive	more than 20 PL/m ²



Floating cage module with plastic drums as floats

Feeding rate (semi-intensive)

Average prawn weight (g)	Amount of feed (% of total prawn weight)
<5	10
5 - 15	7
15 - 25	5
>25	3



Harvested prawns