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Aquafeeds

Grow-out test of freshwater prawns finds effects of feed protein levels limited

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The relative interest of potential farmers to grow freshwater prawn (*Macrobrachium rosenbergii*) depends on the relative economic viability of the prawn enterprise.

At this time, the development of yield-enhancing and cost-reducing technological innovations would improve the economic viability of this emerging industry.

In Mississippi, USA, 80 ha have been used to produce freshwater prawns, compared to more than 40,000 ha devoted to catfish production. One commercial freshwater prawn operation in the Mississippi Delta reported an average yield of 900 kilograms per hectare in 1998-1999 from 0.8-ha ponds stocked with 34,600 postlarvae per hectare.

Harvested prawns in the test averaged 22 animals per kilogram.

A larger commercial operation in coastal Mississippi reported prawn yields of less than 1,000 kilograms per hectare in 0.8- and 1.2-ha ponds in 2001.

Research efforts at the Coastal Aquaculture Unit of Mississippi State University in Gulfport, Mississippi, USA have focused on development of an economically viable freshwater prawn production system. As part of this work, the university conducted trials to determine the effects of protein content in feed on the survival, count, yield, and feed conversion of freshwater prawns raised in ponds. A grow-out experiment using different feed protein levels in 0.10-ha ponds was conducted at the Coastal Aquaculture Unit.

Pond preparation

Twelve randomly selected ponds consisting of three control ponds and nine treatment ponds were used in the experiment. The ponds were drained in November 1999, soil pH was measured, and agricultural lime was applied at an average rate of 2.4 metric tons (MT) per hectare. Ponds were flooded to about 1.2 meters deep, and rotenone was applied at 900 milliliters per pond in May 2000. A 1/2-hp electric aerator was installed in each pond.

Stocking

Each pond was stocked in June 2000 with 4,500 45-day old juveniles weighing 0.15 grams each – equivalent to 44,478 PLs per hectare. The juveniles were transported from a commercial hatchery 30 minutes away in a live-haul truck. For acclimation, half the water in each of the 12 tanks was replaced with pond water. The juveniles were transferred to buckets and stocked in the ponds, allowing them to swim out of the buckets at their own pace.

Feeds and feeding

Feeding schedules were prepared for three feeding periods: first 30 days, second 30 days, and last 60 days. A daily ration of cottonseed meal was provided in all ponds during the first 30 days at a rate of about 3.7 kilograms per hectare. In the control ponds (treatment A), prawns were fed pelletized, 32 percent-protein sinking catfish feed from day 31 until harvest.

The first set of three treatment ponds (treatment B) received the same catfish feed from day 31 to day 60, with extruded, 35 percent protein sinking shrimp feed from day 61 until harvest time. Prawns in a second set of three ponds (treatment C) were fed catfish feed during the second period, and with extruded, 40 percent-protein sinking shrimp feed during the final period. In the final set of three ponds (treatment D) 35 percent protein shrimp feed was applied from day 31 until harvest. All feed was broadcast twice daily along each side of the ponds, at 8-9 a.m. and 4-5 p.m.

Water quality

Dissolved oxygen and temperature were monitored daily, and salinity, pH, total ammonia, nitrogen, and nitrite were measured on a biweekly basis.

Harvest

During harvest, ponds were drained through screened drainpipes and pumps to avoid accidental release into the environment. Prawns were picked up from low areas in the pond and harvest sumps located near the drainpipes. They were washed, weighed, loaded in totes with ice, and transported to the processing plant.

Results

The use of higher feed protein levels in the experimental prawn grow-out did not produce higher prawn yields. Different feed protein levels had no significant effects on prawn survival rate, harvest size or count, yield, or gross feed conversion.

Prawn yields (Fig. 1) averaged 1,049 kilograms per hectare, ranging from 906 kilograms per hectare for treatment C to 1,183 kilograms per hectare for treatment A. Survival rates averaged 51 percent. Prawn counts were about 22 animals per kilogram, and gross feed conversion ratio was 3.5 kg feed per kilogram prawn (Fig. 2).

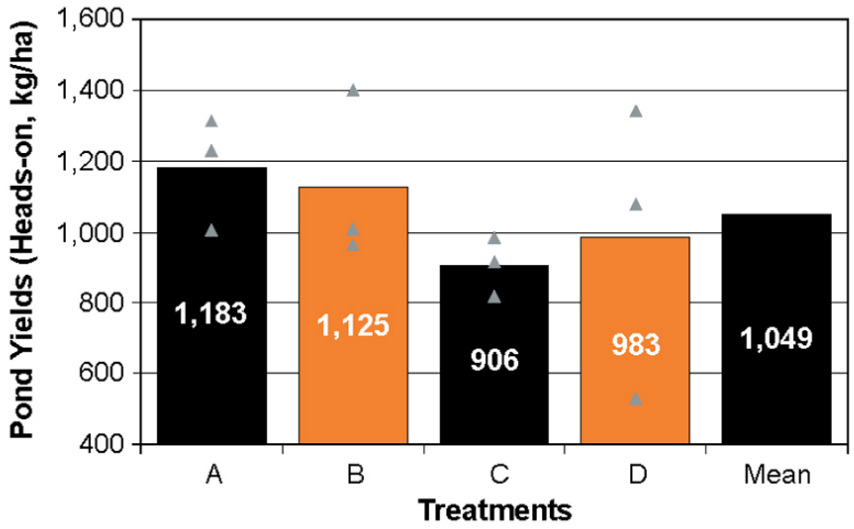

Fig. 1: Pond yields for freshwater prawns raised under four trial feed treatments.

Fig. 2: Gross feed conversion for freshwater prawns raised under four trial feed treatments.

Although not significantly different, better survival, count, yield, and feed conversion were observed among ponds with the sinking catfish feed. These results, however, indicated that 0.10-ha pond yields averaging 1,049 kilograms per hectare were attainable at a stocking density of 44,478 postlarvae per hectare.

Conclusion

Our results showed no significant effects of different protein levels on freshwater prawn production. Earlier results by other U.S. investigators also indicated insignificant differences in pond yields from the use of a commercial catfish feed and an experimental shrimp feed with varying protein levels. Our efforts to develop a better feed will continue so that Mississippi prawn farmers can competitively produce freshwater prawns at sustainable levels.

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