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Pond-condition improvements used to manage WSSV in Peru

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By Lee Lippert

Experiment produced good survival rates where the virus is established

View of main water distribution canal at Isla Bella Farm.

Langostinera Isla Bella in northern Peru is a 185-ha shrimp farm that was seriously affected by WSSV. In late 1999, the decision was made to attack the problem by improving the environment rather than looking for a pharmaceutical solution. In a test of two production ponds, farm management decided to use an environmentally friendly oxidizing agent to treat the water, and aeration to sustain the improved environment.

As the farm staff investigated the options, it became obvious that water exchange would have to be limited and stocking densities increased to compensate for the higher cost of aeration and water treatment. Artificial substrates (AquaMats™, Meridian Aquatic

Technology, LLC), were also chosen, based on the need to work with higher stocking densities.

The farm

Isla Bella is located 2 km from the ocean near Tumbes, Peru. The water intake is on a canal shared by several shrimp farms in the area. Water is pumped into a concrete basin and distributed by gravity to all ponds using an open concrete channel. In the test, a series of nets and screens were placed in the channel across the area where the water entered the ponds.

Water treatment

The water was treated with an oxidizing agent while in the channel. The unlined ponds required 3 percent additional water daily to compensate for evaporation and seepage. When the ponds next to the test ponds were filled, seepage dropped and daily exchange was reduced to 2 percent.

Pond setup and management

Two 1.5-ha ponds were used in the test. Pond 1 was stocked at 27 postlarvae (PLs) per square meter and pond 2 was stocked at 40 PLs per square meter. Group AquaGen in Cartagena, Colombia, supplied PL8-10 seedstock. Pond 1 used six 2-hp air injectors, and pond 2 used eight 2-hp air injectors. Pond 2 had AquaMats and pond 1 did not. Feeding was done using feeding trays. We used a local feed (Nicovita) and received technical support from this company throughout the test.

Pond monitoring

The test was conducted during the coldest time of the year in Peru. Pond records were maintained for dissolved oxygen, temperature, pH, salinity, bacteria count by type in the water and shrimp and water chemistry.

At approximately eight weeks, the first of two polymerase chain reaction (PCR) scans was done at the Center for Aquaculture Services in Ecuador. The second scan was done two to three weeks after the first. Both PCR scans came back positive, showing light infection. After the second scan, histology was performed, with negative results.

Production results

Pond 1 was harvested on day 85 after stocking, with 78.2 percent survival and animals averaging 8.67 grams. Pond 2 was harvested on day 95 after stocking, with 90.3 percent survival and animals averaging 9.36 grams. FCR in both ponds was about 1.1:1.

The relatively slow growth was attributed to the low prevailing temperatures. The decision to harvest was based on an observed increase in red coloration on shrimp tails and the activity of the shrimp in the ponds, indicating the potential for a WSSV outbreak.

Conclusion

This experiment produced very good survival rates in an area where WSSV is established and where other efforts have failed or had poor results. This was obviously not a controlled scientific study, as only two ponds were used and there were no control ponds. But it was an all-out effort against the WSSV problem that showed encouraging results.

Further work is still needed. However, it is obvious that improved control over the pond environment must be part of any WSSV-management strategy. We are grateful for the considerable technical support provided by Meridian Aquatic Technology, LLC.

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Author

LEE LIPPERT

Equipment & Technology, Inc.
Jacksonville, FL 32239 USA

lprt@mediaone.net (mailto:lprt@mediaone.net)