Aquaculture Case Study

Nanobubble Technology for Better Dissolved Oxygen Management in Aquaculture
Kakinada | Andhra Pradesh, India

Location:

Kakinada, Andhra Pradesh

Application:

Shrimp Aquaculture

Unit installed:

Nanokriti Oxygen Nanobubble Generator

Results:

- Higher Minimum Dissolved Oxygen Levels
- Improved DO Stability During Critical Low-Oxygen Hours
- Reduced Risk of Severe Oxygen Depletion
- More Consistent Oxygen Availability Across the Culture Period

To evaluate the performance of nanobubble technology under practical aquaculture conditions, Nanokriti carried out field trials in fish and shrimp ponds at Kakinada, Andhra Pradesh.

The trials focused on one of the most important challenges in aquaculture, maintaining adequate dissolved oxygen, especially during periods when DO levels fall and aquatic species become more vulnerable to stress.

Intervention

Nanokriti's nanobubble generator was integrated into the existing pond system to circulate oxygen-enriched water.
The system worked alongside the existing aquaculture setup without requiring major changes to the pond infrastructure. Dissolved oxygen levels were monitored during the trials to assess how effectively nanobubble treatment could maintain oxygen availability under real field conditions



Mechanism

Unlike conventional larger bubbles that quickly rise to the surface and release gas into the atmosphere, nanobubbles remain suspended in water for longer periods.

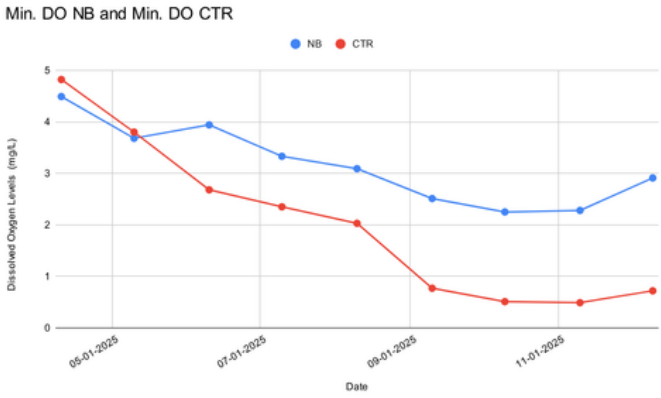
Their extremely small size and high gas-water contact area help improve oxygen dissolution and allow oxygen to remain available in the water for longer, supporting more stable and uniform DO conditions across the pond.

Results & Key Findings:

The nanobubble-treated pond maintained higher minimum dissolved oxygen levels throughout the monitoring period.

During the later stages of the trial, minimum DO in the treated pond remained around 2.2–2.9 mg/L, while the control pond dropped to approximately 0.5–0.8 mg/L at its lowest points.

The difference was most noticeable during critical low-oxygen periods, where the nanobubble system helped avoid the sharp DO decline seen in the control pond.



Conclusion

The Kakinada trial showed that nanobubble oxygenation can help maintain more stable dissolved oxygen conditions in shrimp ponds, particularly during critical low-DO periods.

Compared with the control pond, the nanobubble-treated pond maintained higher minimum DO and avoided severe oxygen depletion.

The trial highlights the potential of Nanokriti's nanobubble system as a practical solution for better oxygen management and a more stable shrimp culture environment, while fitting into existing pond infrastructure.

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