

Novozymes - Unlocking the magic of nature

Novozymes is the biotech-based world leader in enzymes and microorganisms. We develop natural microbial solutions for a wide range of industries including waste treatment, sanitation, industrial cleaning, aquaculture, consumer and agriculture. Using nature's own technologies, we continuously expand the frontiers of biological solutions to replace harmful chemicals with environmentally friendly technology.



PondPlus® add life to your pond



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- add peace of mind
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- add stress-free living
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- add science



The challenges in shrimp farming

Shrimp aquaculture is widespread throughout the tropical world. However, today the industry is beset by disease, mostly due to bacteria and viruses. The high density of animals in hatchery tanks and ponds is conducive to the spread of pathogens in the aquatic environment. Ammonia and hydrogen sulphide build up, viral attacks, oxygen depletion, and high toxicity compound the problem of deteriorating the pond environment.

What this means is that the investment in good seed and good feed might not translate into a good yield if the pond environment is not conducive.

So how does the farmer protect his pond and crop? How does he maintain the pond environment, prevent disease and increase his yields?

The magic of microbes

Microbial technology from Novozymes, the leader in microbial ecology, can provide a solution to these problems. Novozymes' PondPlus® is a synergistic blend of spore forming bacteria, which displaces harmful bacteria by competitive processes.

PondPlus® is very effective in decomposition of undesirable organic substances in aquaculture water and significantly improves the ecological environment of the pond. It provides for a better balance of phytoplankton and beneficial microbes, leading to an improvement in the oxygenation and nutrition level of the shrimps.

When used in conjunction with good farm management practices, PondPlus® ensures good algal balance, good pond colour, reduction in stress and improved shrimp yields.

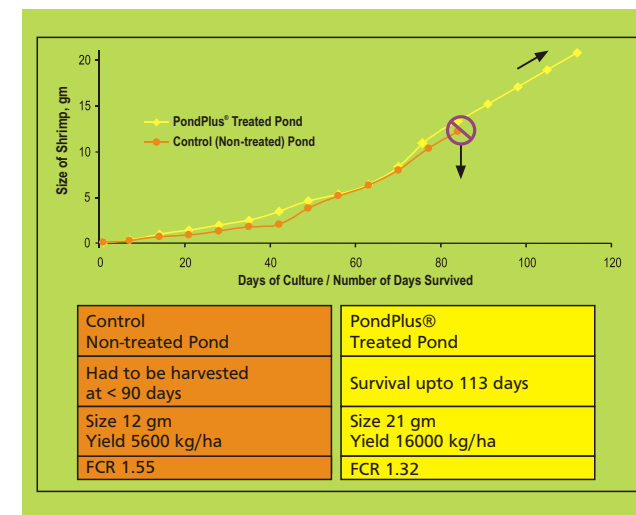
The PondPlus® Protection



The 80 to 90 days period during the culture cycle is the **Critical Growout Period** (CGP). The water quality tends to deteriorate rapidly during this period owing to high organic load, reduced levels of dissolved oxygen and increased toxic conditions. With PondPlus® it is possible to protect the shrimp during this Critical Growout Period, maintain survival rate and increase harvest yield.

The graph below shows results of trials conducted with and without PondPlus®. The culture in the non-treated control pond had to be harvested at less than 90 days whereas the culture in the PondPlus® treated pond could be maintained till over 110 days.

The treated pond yielded both a bigger shrimp size (21 gm/piece vs. 12 gm/piece), a bigger harvest (16,000 kg/ha vs. 5600 kg/ha) and an improved feed conversion ratio (1.32 FCR vs. 1.55 FCR).



Safeguarding your pond through the 80 to 90 days Critical Growout Period

Power of Seven

Strain	Enzymatic Strengths	Low Oxygen Growth Ability	Optimum Salinity	VFA Digestion	Anti Vibrio Activity	Stress Reduction (PPO measurement)	Most Enhanced Capabilities
Bacillus Strain A	Protease • Amylase Cellulase • Xylanase Esterase	++ 2-8 ppm O ₂	0-15 ppt	++	NA	+	Denitrification ability
Bacillus Strain B	Protease • Lipase Amylase	+ 3-8 ppm O ₂	0-15 ppt	+	NA	+	Rapid Germination
Bacillus Strain C	Protease • Amylase Cellulase • Xylanase	+++ 1.5-8 ppm O ₂	0-35 ppt	+	++	+	Flocculation enhancement
Bacillus Strain D	Lipase • Amylase Cellulase	++++ 1-8 ppm O ₂	5-20 ppt	+	++	+	Denitrification ability
Bacillus Strain E	Lipase • Amylase Cellulase	++ 2-8 ppm O ₂	0-25 ppt	++	NA	+	Sludge Digestion
Bacillus Strain F	Protease • Lipase Cellulase • Xylanase	+ 3-8 ppm O ₂	0-17 ppt	+	++	+	Anti-microbial
Bacillus Strain G	Protease • Amylase Cellulase • Xylanase	+++++ 0.5-8 ppm O ₂	0-45 ppt	+++	++	NA	Anti-microbial

VFA - Volatile Fatty Acids PPO - Pro-phenyl Oxidase NA - Not Analysed

Packing and Dosing Methodology

Dry PondPlus® is available in water-soluble packages - Solupak™, as well as in bulk pails. Solupaks™ dissolve within a few minutes, releasing their contents quickly near the surface for rapid and convenient dispersal.

Typically, PondPlus® is directly applied to the shrimp pond from a dock, feeding boat, or pond-side at recommended rates and frequencies.

Standard Shrimp Pond Treatment Programs (1-2 meters deep at center)

Application date	10-25 pl/m ² Black Tiger or < 80 pl/m ² White Shrimp	> 25 pl/m ² Black Tiger or > 80 pl/m ² White Shrimp
7 days before stocking	800-1,000 g/10,000 m ²	1,200-1,500 g/10,000 m ²
Day of stocking	300-500 g/10,000 m ²	800-1,000 g/10,000 m ²
Every 7-10 days after stocking	300-500 g/10,000 m ²	800-1,000 g/10,000 m ²
Total Amount used Kg/Crop/10,000 M²	5-8 Kg.	10-15 Kg.

NOTE: These are general recommendations. Dosing is also dependent on local environment conditions and practices.

