

Ammonia & Nitrite

Kill



Guard your crop with

PondProtect[®]
Ammunition against Ammonia & Nitrite

Ammonia & Nitrite

The inorganic killers in the pond



High ammonia and nitrite levels cause acute and chronic effects that reduce the animal's disease resistance, stunt growth and dramatically impact yield. They deteriorate water quality, increase blood pH of the animal, reduce the oxygen content in the blood, affect gills causing stress and increase the mortality rate.

Stress caused due to toxic ammonia and nitrite levels has cost farmers entire crops, resulting in devastating losses.

Nitrite

is even more dangerous

Among the two, it has also been observed that nitrite related mortality is higher than ammonia related mortality in later days of the culture. Even levels as low as 0.45 ppm of nitrite can be hazardous to the shrimp health.

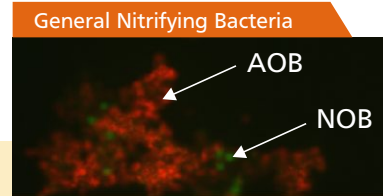
Species	Temperature/ Salinity ppt	Toxic Values, ppm	
		Total Ammonia-N (NH ₃ + NH ₄)	Nitrite-N
P chinensis	26 C/33	> 3.51	> 2.3
Litopenaeus vannamei	20 C/2		> 0.45
	20 C/15		> 6.1
	20 C/25		> 15.2
P monodon	27 C/20	> 3.7	> 3.8



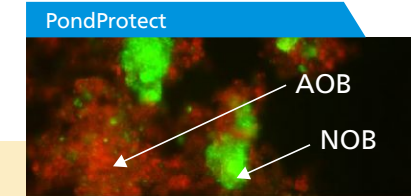
Solution from Novozymes



Novozymes Biologicals' PondProtect® is a unique patented consortium of two nitrifying bacteria - AOB - Ammonia oxidizing bacteria *Nitrosomonas eutropha* and NOB - Nitrite oxidizing bacteria *Nitrobacter winogradskyi*. These bacterial work in a consortium such that they reduce not just the ammonia but also the nitrite levels in the pond water and show action within 3 days.



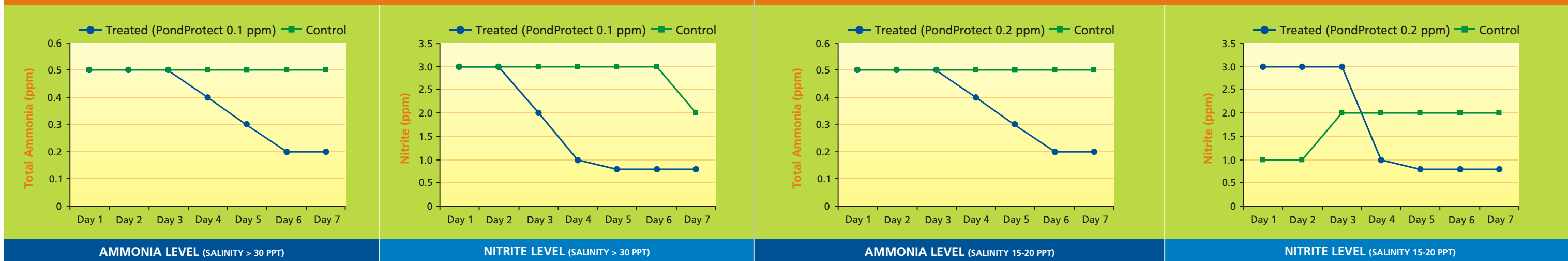
Most nitrifying products in aquaculture derived from industrial applications are only able to effectively tackle the problem of ammonia but not nitrite. A Fluorescent In-Situ Hybridization of competing products shows presence of AOB (Ammonia oxidizing bacteria) but very weak indication of NOB (Nitrite oxidizing bacteria).



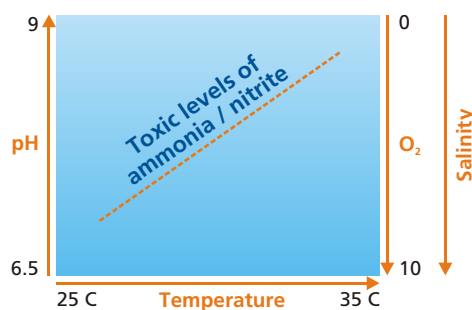
PondProtect® is not just strong in ammonia reduction but has especially strong nitrite reduction characteristics. A Fluorescent In-Situ Hybridization of PondProtect® nitrifying consortium shows an equally strong presence of AOB as well as NOB (Nitrite oxidizing bacteria).

Ammonia and nitrite level build up in the non treated (control) pond with advancing culture days. However, in ponds treated with PondProtect®, ammonia levels and nitrite levels dropped within 3 days of application. The NH₃ and especially NO₂ spikes in the non-treated ponds were serious enough to cause mortality of the culture and force early harvesting while treated ponds had higher survival and longer culture period.

POND STUDY RESULTS OF PONDPROTECT®



The problem can hit anytime!




Toxicity of ammonia and nitrite depends on a fine balance between the water quality parameters such as pH, temperature, and dissolved oxygen. The toxicity of ammonia increases when temperature increases, pH increases, or oxygen level in pond water drops. The toxicity of nitrite increases as salinity decreases and temperature increases. With higher stocking density of shrimp, or longer culture periods, ammonia/nitrite problems can become quite serious very rapidly. This can cause high stress on the shrimp, resulting in reduced feeding and strong potential for viral disease.

Emergency treatments don't always work nor are they long-lasting. So do you have a solution that prevents build up and combats not just ammonia, but also nitrite?

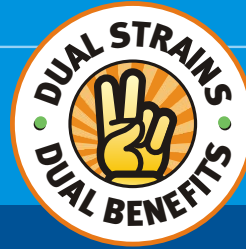
Application details

There are two critical periods during the crop cycle when pond is most susceptible to rise in ammonia, nitrite toxicity. These are between 20-45 DOC (days of culture) and then above 70 DOC when typically organic load in the pond is high and conditions begin to get anaerobic. PondProtect is recommended to be used as a preventive treatment during these critical periods. It can also be used at higher dosage levels during emergency conditions.

IDEAL CONDITIONS FOR PONDPROTECT TO WORK	Dissolved Oxygen > 4 ppm Alkalinity > 100 ppm	
		When you first detect Ammonia/Nitrite (generally DOC 20-45)
Apply PondProtect at	0.1 ppm/ or 1-2 kg/ha	0.2 ppm/or 3-4 kg/ha
Then Test after 3 days		
If level still persists	Reapply 0.1 ppm every 3 days till level goes down	Reapply 0.1- 0.2 ppm every 3 days till level goes down

(In general the dosage will be at 0.1-0.2 ppm.)

PondProtect[®]
Proven Performance



Product Specifications

Composition	Blend of two natural non-pathogenic nitrification strains <i>Nitrosomonas eutropha</i> and <i>Nitrobacter winogradskyi</i>
Product Activity	Ammonia Oxidation Rate 1000 - 1200 mg N-NH ₃ /kg/hr Nitrite Oxidation Rate 250 - 300 mg N-NO ₂ /kg/hr
Appearance	Tan free flowing powder
Odour	Yeast like
Optimum pH Range	7.5 - 8.3
Optimum Temperature Range	27 ^o - 32 ^o C
Shelf Life	1 year at 23 ^o C, 6 months at 35 ^o C and 4 months at 45 ^o C

novozymes[®]
Rethink Tomorrow



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