

# Management Practices Used in Intensive Shrimp Farming in SE Asia



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12 June 2013



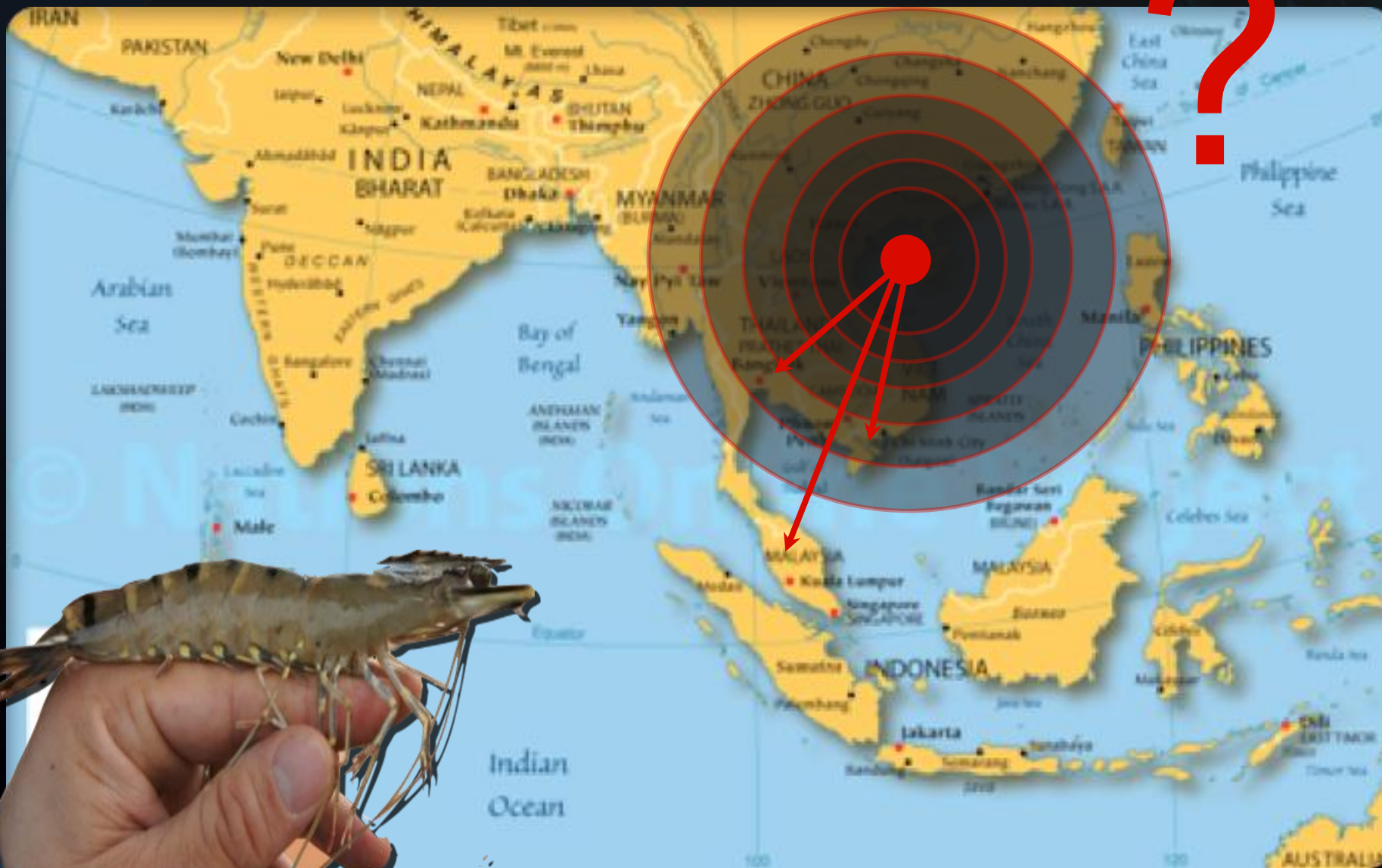


# Agenda

- Shrimp Farming in SE Asia: intensive ponds
- Biosecurity Implementation
- Nutrition and feeding management
- Aeration Management
- Water and Soil Quality Management
- Mixotrophic<sup>™</sup> System by Blue Aqua



## EMS, source and spreading in SE Asia



China, 2009,  
Southern coast  
of China

Vietnam, 2010,  
Eastern coast of  
Delta and South  
China

Malaysia, 2011

Thailand, 2012,  
Gulf of Thailand:  
East Coast



## Shrimp Farming in SE Asia: intensive ponds

- Advanced technology
- Using full artificial feeding, aeration and water pumping, reservoir
- Stocking density (*L. vannamei* 80 – 125 PL/m<sup>2</sup> or *P. monodon* 25 - 50 PL/m<sup>2</sup>)
- Productivity (*L. vannamei* 9 – 15 ton/ha, *P. monodon* 5 – 8 ton/ha)
- Monoculture





## Shrimp Farming in SE Asia: intensive ponds

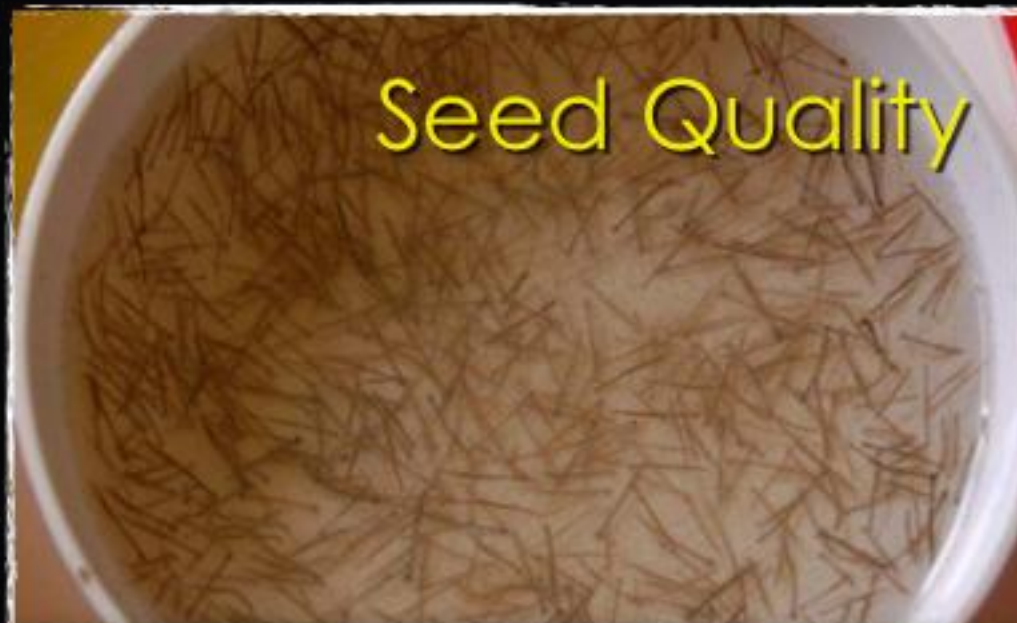


### Pond Bottom Soil and Sediments

- Accumulation of nutrients, organic matters and sludge
- Soil and water interface
- Decreased minerals availability and pH



## Shrimp Farming in SE Asia: intensive ponds



Disease outbreak is a result of a poor management, closely related to **pond health status**, that induces a decrease in productivity in a long and short term.



# BLUE AQUA®



Biosecurity implementation to prevent from disease



# BLUE AQUA®



Staff and visitors hygiene management



# BLUE AQUA®



Preventive measures at the feeding area



## Feeding Method



*Manual vs. automatic feeding: feed efficiency optimization.*





Feeding Regime Example	
Shrimp Weight (g)	Feeding (%)
2	8.0
3	7.0
5	5.5
7	4.5
10	3.7
12	3.2
15	2.5
20	1.8
25	1.5
30	1.2

## Feeding Regime

- Shrimp size and requirements.
- The Feeding (%) values may vary depending on many factors and these are not fixed, e.g. for 2 g shrimp it can be 7.5 to 8.0.



## Blind Feeding Regime

UMUR	KODE PAKAN	Pemberian / hari	Pakan / hari ( kg )	Total Kuml. ( kg )	Penambahan pakan/hari
1	0	3 x	3.00	3.00	200 gr
2	0	3 x	3.20	6.20	
3	0	3 x	3.40	9.60	
4	0	3 x	3.60	13.20	
5	0	3 x	3.80	17.00	
6	0	3 x	4.00	21.00	
7	0	3 x	4.20	25.20	
8	0	3 x	4.40	29.60	
9	0	3 x	4.60	34.20	
10	0	3 x	4.80	39.00	
11	01	3 x	5.20	44.20	400 gr
12	01	3 x	5.60	49.80	
13	01	3 x	6.00	55.80	
14	01	3 x	6.40	62.20	
15	01	3 x	6.80	69.00	
16	01	3 x	7.20	76.20	
17	01	3 x	7.60	83.80	
18	01	3 x	8.00	91.80	
19	01	3 x	8.40	100.20	
20	01	3 x	8.80	109.00	
21	02	4 x	9.40	118.40	600 gr
22	02	4 x	10.00	128.40	
23	02	4 x	10.60	139.00	
24	02	4 x	11.20	150.20	
25	02	4 x	11.80	162.00	
26	02	4 x	12.40	174.40	
27	02	4 x	13.00	187.40	
28	02	4 x	13.60	201.00	
29	02	4 x	14.20	215.20	
30	02	4 x	14.80	230.00	



DOC (days)	Weight (gram)	Length (cm)	Feed Code	%Pakan	Feeding / day	( %) F. Tray	Control (hour)
31 - 41	2,3 - 3,5	3,5 - 5,5	^03	5,80 - 4,80	4	0,6	2,5
41 - 51	3,5 - 5,5	5,5 - 6,5	^03 P	4,80 - 3,80	4	0,6	2,5
51 - 61	5,5 - 7,8	6,5 - 7,5	^ 03 P	3,80 - 3,20	4	0,8	2,0
61 - 71	7,8 - 10,0	7,5 - 8,5	^04 S	3,20 - 2,85	4	0,8	2,0
71 - 81	10,0 - 12,0	8,5 - 9,5	^ 04S	2,85 - 2,60	4 - 5	1,0	2,0
81 - 91	12,0 - 13,8	9,5 - 10,5	^ 04	2,60 - 2,40	5	1,0	1,5
91 - 101	13,8 - 15,8	10,5 - 11,5	^ 04	2,40 - 2,25	5	1,2	1,5
101 - 111	15,8 - 18,2	11,5 - 12,5	^05	2,25 - 2,10	5	1,2	1,5
111 - 121	18,2 - 20,7	12,5 - 13,5	^ 05	2,10 - 1,95	5	1,4	1,5
> 121	> 20,7	>13,5	^ 05	< 1,95	5	1,4	1,0

## Feeding Regime



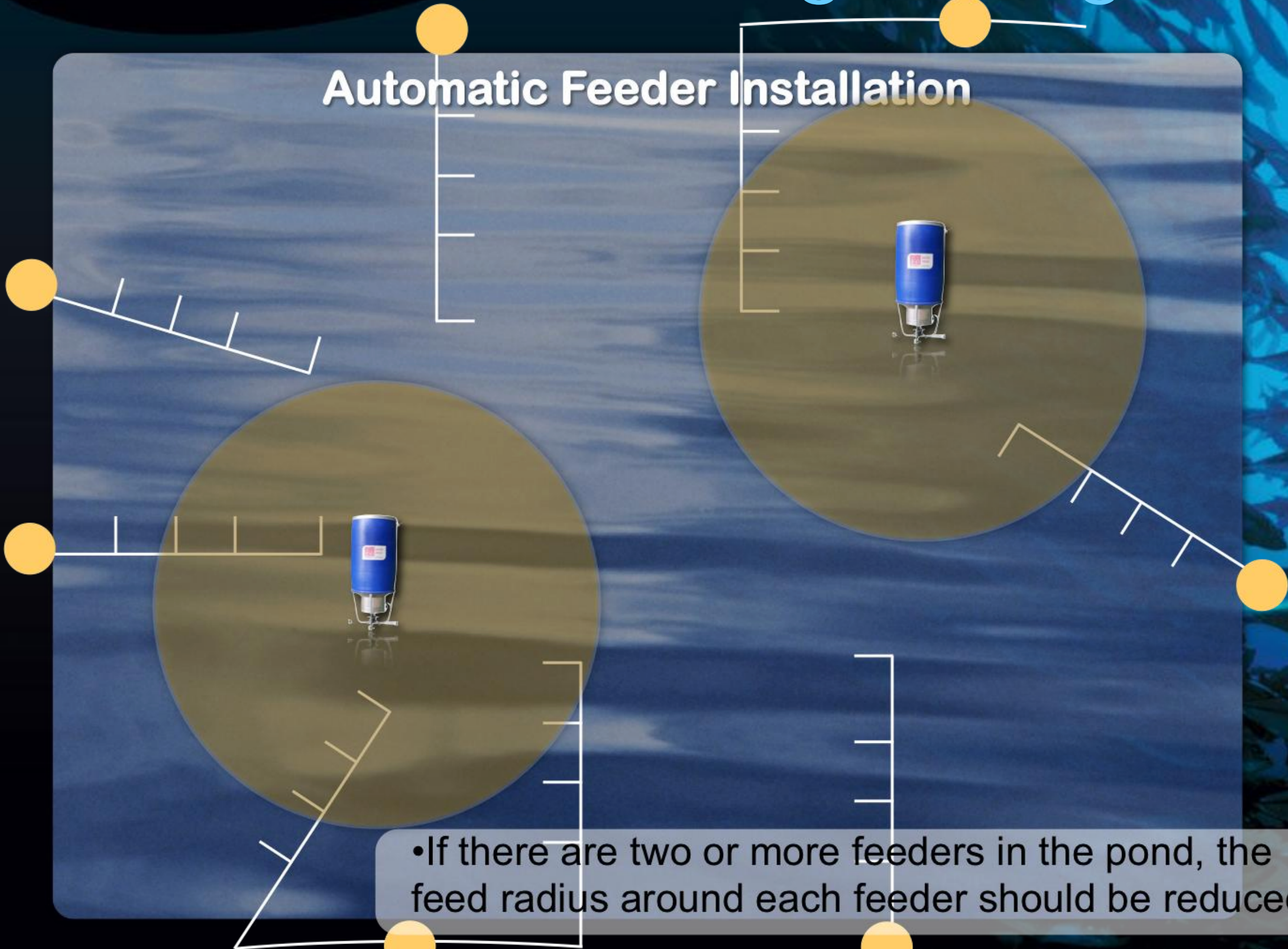
# Feeding Management

Automatic feeder





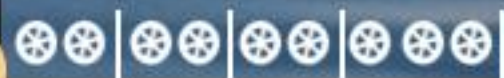
## Automatic Feeder Installation



• If there are two or more feeders in the pond, the feed radius around each feeder should be reduced.



Aerator  
2 HP  
70-80 RPM



Archimedes  
Aerator  
3 HP  
120 RPM



Aerators  
5 HP  
70-80 RPM



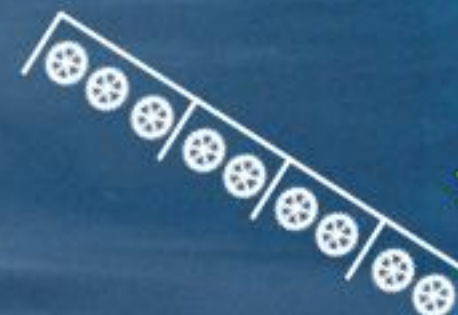
Aerator  
2 HP  
70-80 RPM



Aerators  
5 HP  
70-80 RPM



Aerator  
2 HP  
70-80 RPM

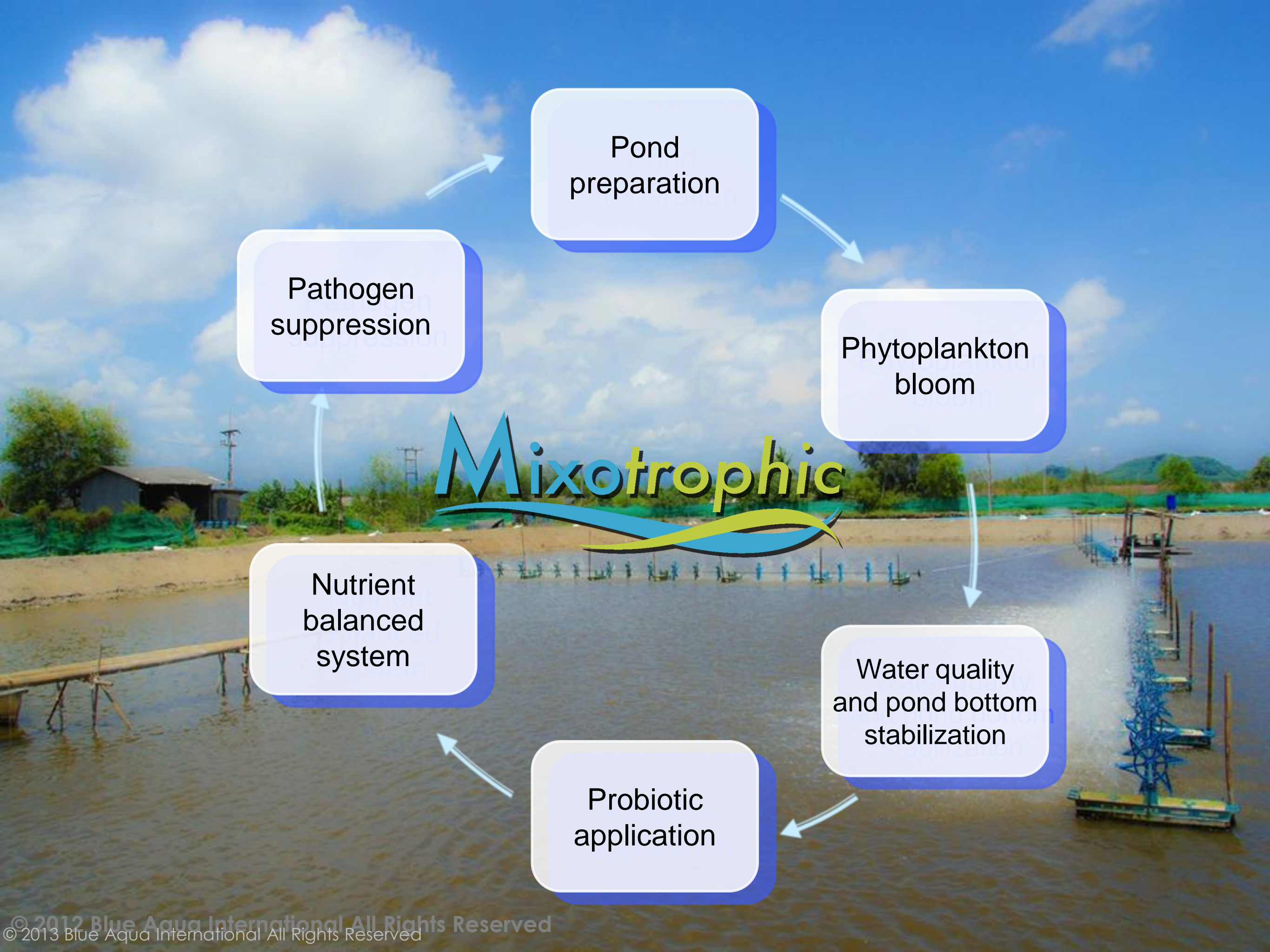




# Pond Management Aeration Management







Pond preparation

Pathogen suppression

Phytoplankton bloom

# Mixotrophic

Nutrient balanced system

Water quality and pond bottom stabilization

Probiotic application



# Pond preparation





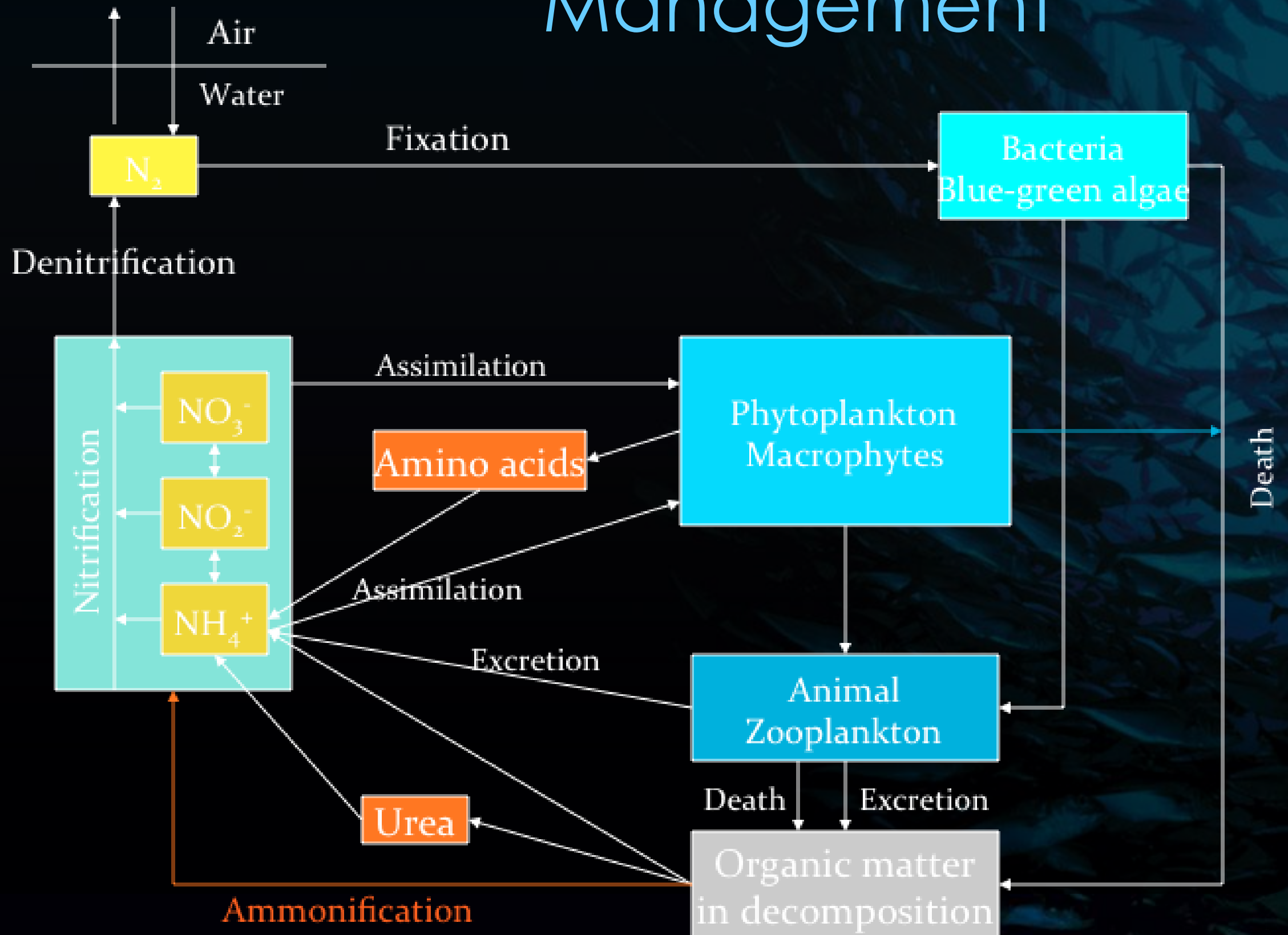
## Phytoplankton bloom

Type	N:P
Nitrogen-fixing BGA	42-125
Green algae	~30
Diatom	~10
Red Algae	~10
Dinophyceae	~12
Blue Green Algae	<10

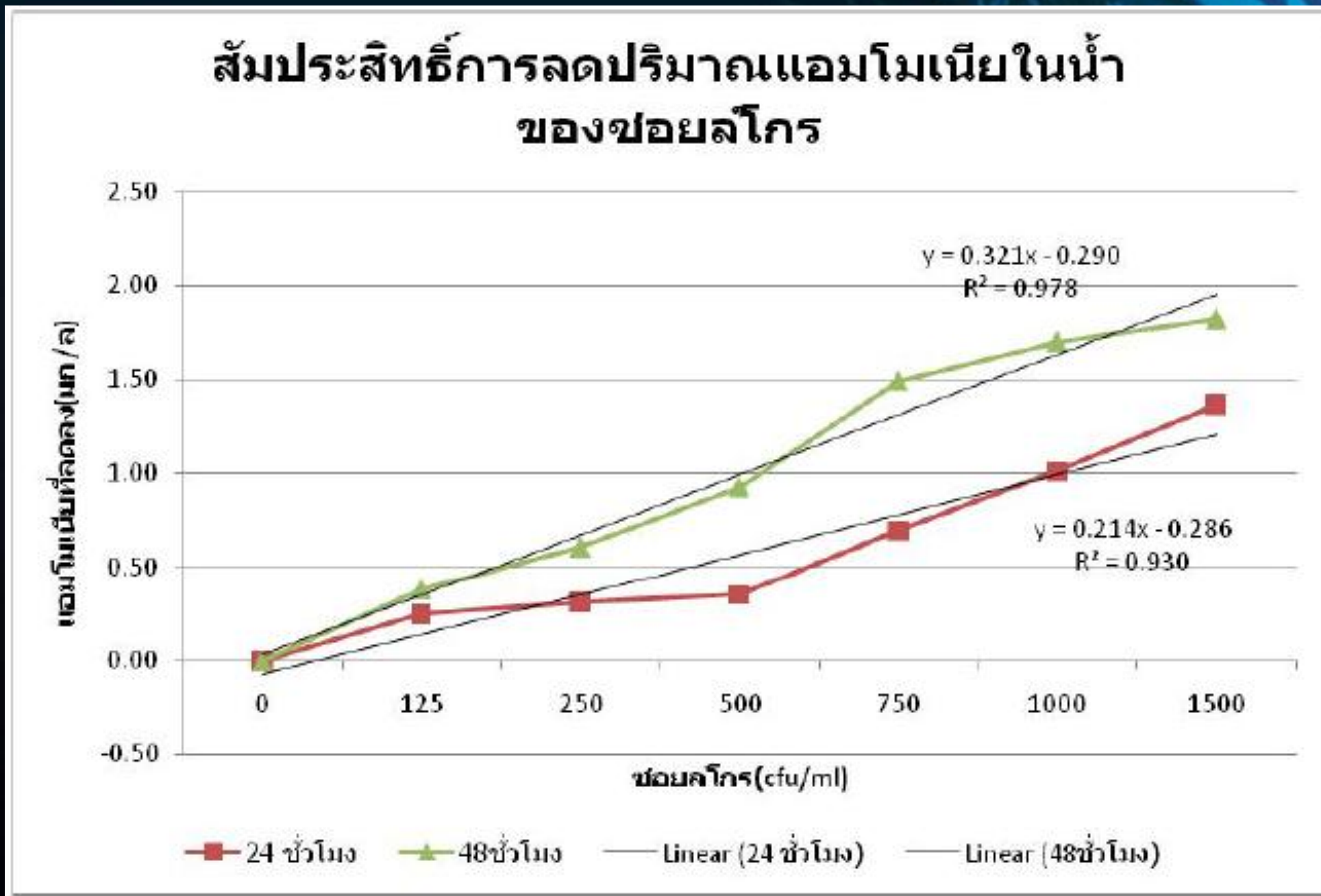
Natural **phytoplankton** bloom induction enhances natural productivity, providing nutritious **natural food**, stabilizing the food chain and improving water quality.



# Water and Soil Quality Management



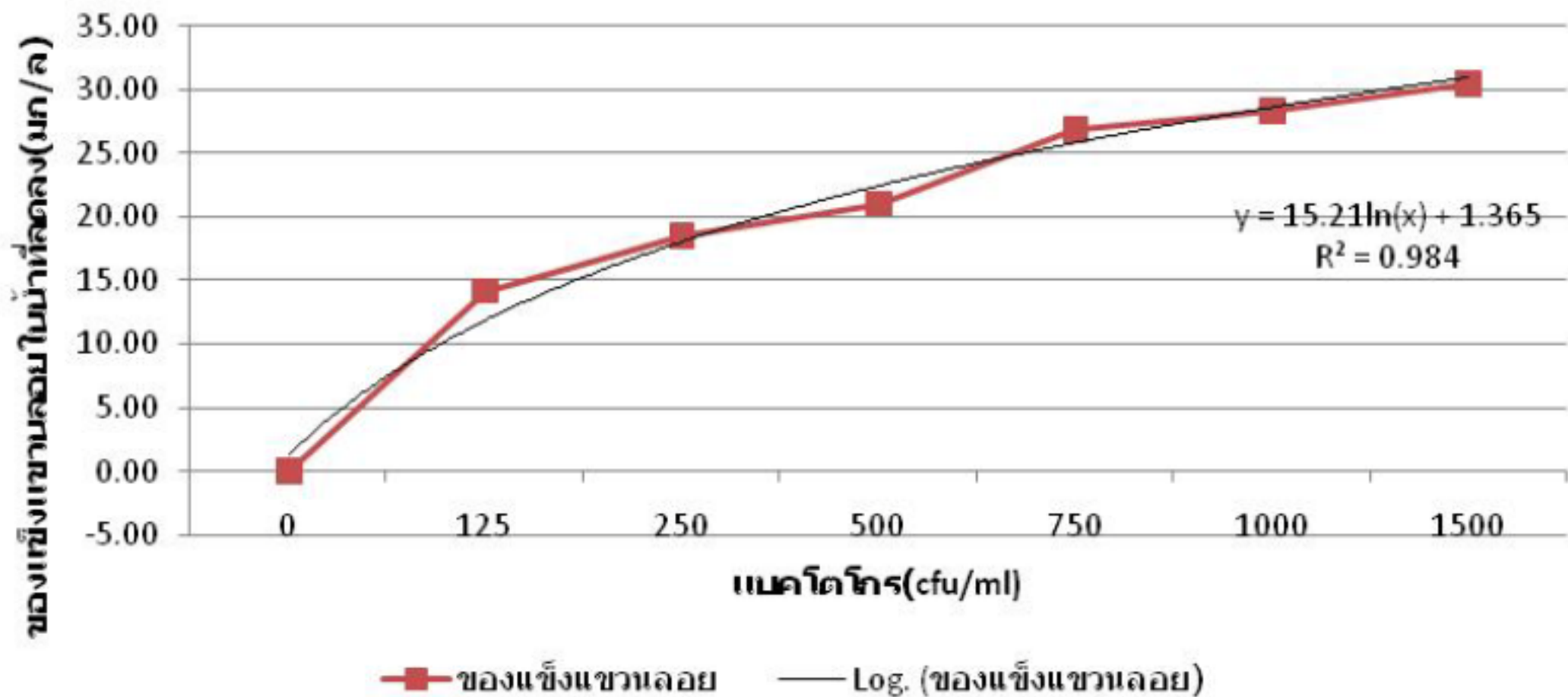




Ammonia reduction of a commercial probiotic application (5 billion cfu/g)



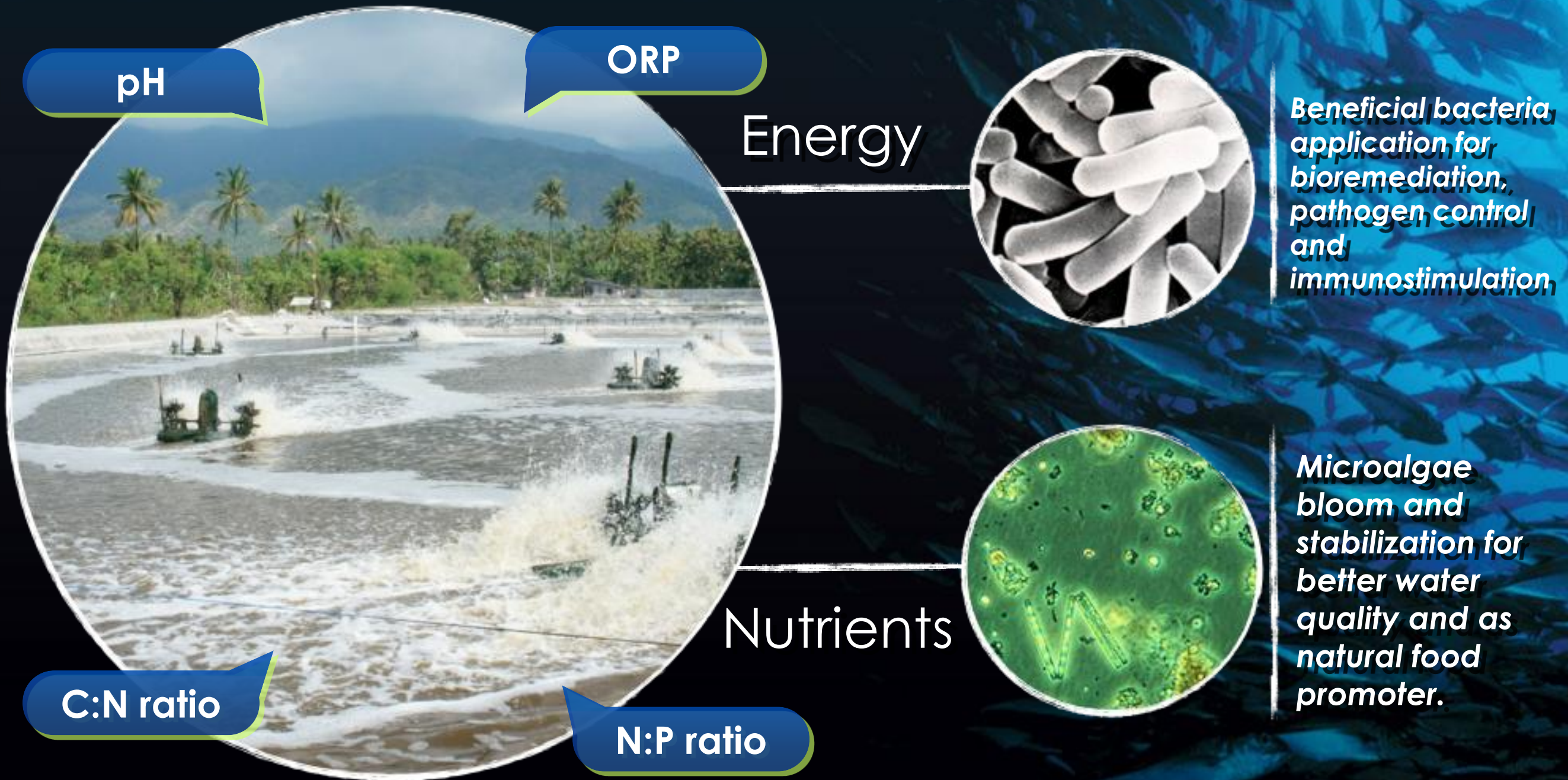
## สัมประสิทธิ์การลดปริมาณตะกอนของเสียในน้ำ ของแบคทีเรีย



TSS reduction of a commercial probiotic application  
(5 billion cfu/g)



## Water and Soil Quality Management



### Pond dynamics modulation



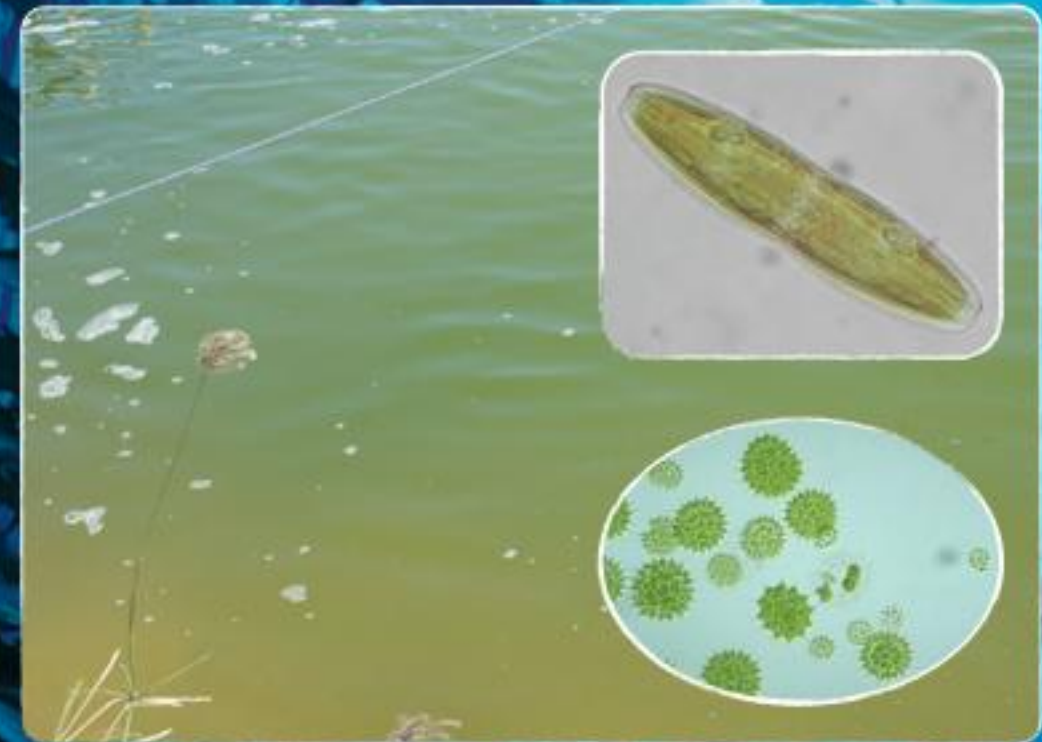
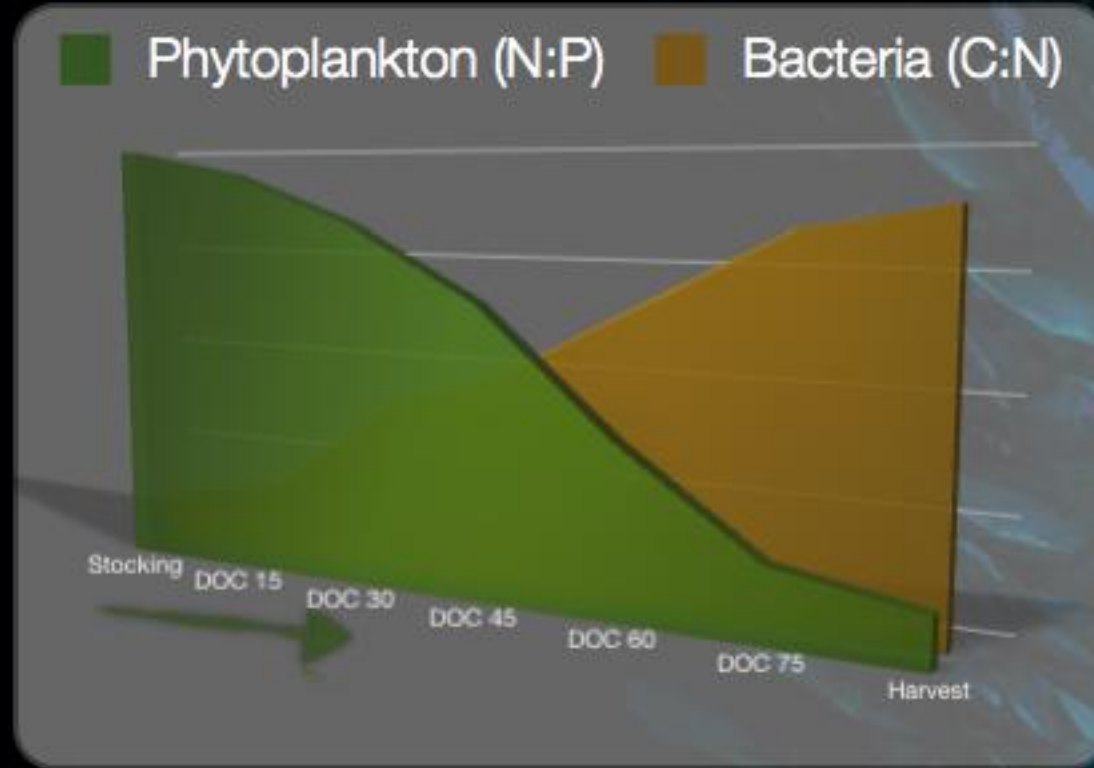
# Pond development throughout production cycle





# Mixotrophic™ stages

## Phytoplanktonic phase

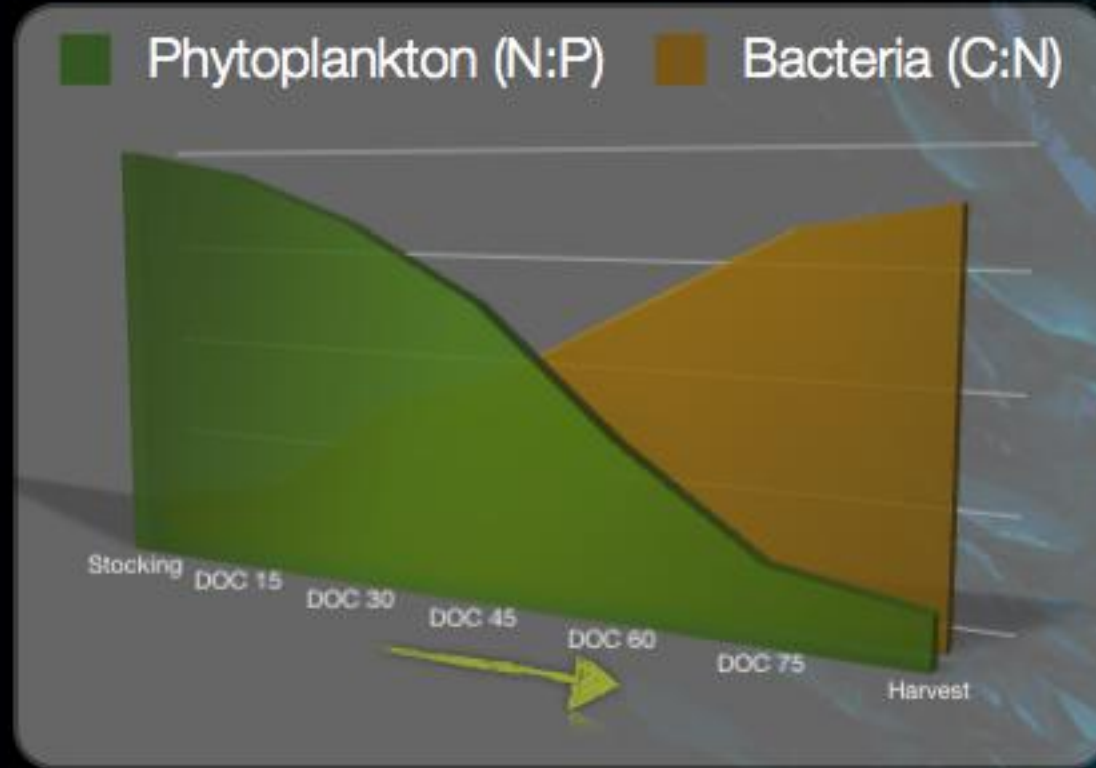


- *Phytoplankton (green algae/diatoms) is food source for PL.*
- *It creates a stable environment for shrimp.*
- *Abundant natural food basis is created.*
- *Water quality parameters (DO and pH) are controlled.*



# Mixotrophic™ stages

## Phytoplanktonic-probiotic phase

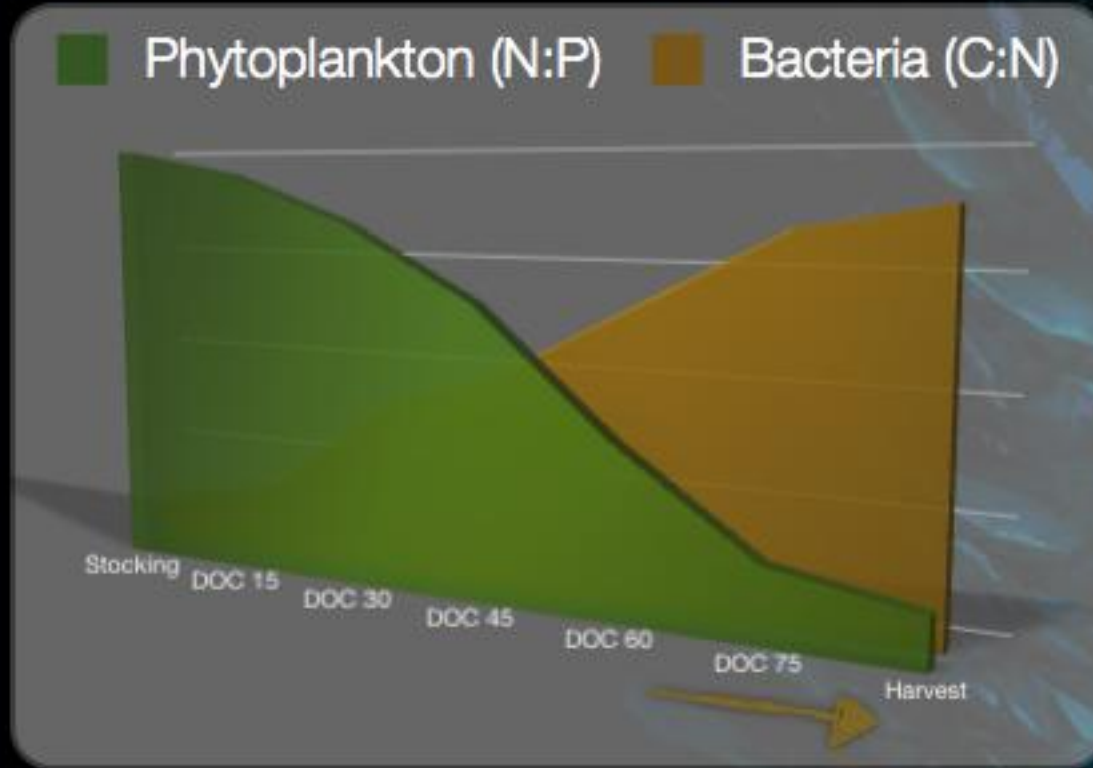


- Increasing organic matter accumulation controlled by bacteria.
- Nitrogen wastes recycled through photosynthesis/nitrification.
- Prevents excessive bloom and die-off.
- Suppresses proliferation of pathogenic bacteria.



# Mixotrophic™ stages

## Probiotic phase



- High organic loads require high microbial activity.
- Less phytoplankton in water, heterotrophic bacteria and nitrifying bacteria promoted to ensure stable water quality.



# Main features

- ★ Use combination species of **microorganisms** to work together for bioremediation.
- ★ Achieve “**zero water exchange**” by integrating special probiotics, **nutrients** and scientific management know-how.
- ★ Stabilizes the food chain in the pond allowing **higher biomass** in the system.





# Mixotrophic System Benefits

## Mixotrophic System Manages the Pond to:

- ✦ *Have an ecologically balanced system*
- ✦ *Minimize fluctuations of water and soil quality*
- ✦ *Increase optimum carrying capacity*
- ✦ *Reduce shrimp/fish stress*
- ✦ *All at economical cost and easy management*



# Thank You

*Blue Aqua International*

