

MICROBE-LIFT®

Cycles Fish Ponds Fast

Understanding the Nitrogen Cycle & Your Pond



Fish Waste plus Uneaten Food Protein & Dead Plant Matter are broken down by the pond biology and ammonia is released

Gaseous nitrogen into the air
Nitrogen Gas (N_2)

Denitrification

The reduction of nitrate in filtered pond anoxic zones

MICROBE-LIFT/PL (already added in step #1) contains denitrifiers that function without oxygen. These select microbes can remove pond nitrates by converting nitrate to nitrogen gas that bubbles harmlessly into the atmosphere under the anoxic conditions in pond filters and biofilms.



Nitrate (NO_3)

is a food source for plants & algae

Nitrobacter sp.

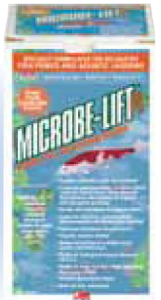
MICROBE-LIFT/NITE-OUT II (already added in step #2) provides the necessary Nitrobacter bacteria required for the oxidation of Nitrite to Nitrate in the pond filter!



4 steps to speed the removal of organic waste, ammonia and nitrate for a clear, clean, nontoxic pond!

step #1: add MICROBE-LIFT/PL

Speeds the removal of all organic waste matter in ponds by adding a select group of microbes that increase the rate of organic breakdown and improve filter performance.



step #2: add ML/NITE-OUT II

Provides the necessary nitrifying bacteria (nitrosomonas and nitrobacter) required for the biological nitrification process, and assures the continued removal of toxic ammonia!



step #3: use ML/KH TEST KIT to test for hardness

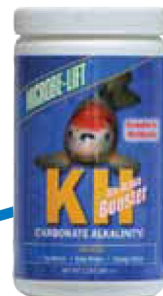
(when needed) step #4: add MICROBE-LIFT/KH Booster

Supplies the necessary carbonate alkalinity required by nitrifying microorganisms. If carbonate alkalinity is NOT present, the pond pH will be unstable and ammonia removal may cease. ML/KH Booster also provides the necessary carbon source for nitrifying bacteria.



Measures the presence of necessary carbonate alkalinity. When below 50ppm, add ML/KH Booster.

Nitrosomonas sp.
(contained in ML/NITE-OUT II)
converts ammonia to
Nitrite (NO_2)





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Understanding the Nitrogen Cycle & Your Pond



MICROBE-LIFT®/PL®, MICROBE-LIFT®/Nite-Out II® and ML/KH Booster®

is the only natural pond treatment program to cycle and balance your pond fast using a safe, microbial, non-chemical biological process which naturally: controls and eliminates waste organic matter, enhances water quality and reduces and controls toxic ammonia, nitrite and nitrate. Just follow these simple steps:

Step #1: Add **MICROBE-LIFT®/PL** to your pond to break down and degrade all waste organic matter, assuring improved environment for aquatic life and plants. **MICROBE-LIFT®/PL** seeds pond water, filters and establishes necessary bio-films in filters and on pond surfaces removing unwanted waste matter and clarifying pond water fast! **MICROBE-LIFT®/PL** will also reduce and eliminate any pond odor.

As the organic waste matter in your pond - i.e., dead plant life, excessive fish food and fish waste - is broken down by pond biology, the waste matter is converted to ammonia in a process called *Ammonification*. As the ammonia levels build in your pond, it can become toxic to fish and pond life and must be biologically removed *quickly*. *Nitrification* - the natural, biological ammonia removal process - is done by a group of microbes called *nitrifying bacteria*. Nitrifying bacteria are very slow to grow (requiring as much as 18 hours for a single cell division compared to every 45-60 minutes for waste degraders) and often require weeks to naturally develop the necessary population to convert all the ammonia produced in your pond.

Step #2: Use **MICROBE-LIFT®/Nite-Out II** to quickly establish the necessary nitrifying cultures and the ammonia removal process in your pond. Just add **MICROBE-LIFT®/Nite-Out II** and these cultures will grow and convert the toxic ammonia to nitrite, then to nitrate. **MICROBE-LIFT®/Nite-Out II** also contains *Nitrosomonas*, which convert ammonia to nitrite, and *Nitrobacter*, which convert nitrite to nitrate.

In addition, you should know the term *Carbonate Alkalinity* because the biological nitrification process that removes toxic ammonia from your pond in order for it to cycle properly requires a source of inorganic carbon. It takes 7.1 pounds of carbonate alkalinity for every pound of ammonia removed from your pond water. If carbonate alkalinity is *not* available in pond water, it's just like your car running out of gas! The nitrification process will stop, or may not even get started. To ensure toxic ammonia is removed by the necessary nitrifying bacteria, you must test your pond water for adequate carbonate alkalinity until there is a minimum of 50 ppm. Then add **MICROBE-LIFT®/Nite-Out II** to ensure rapid and complete ammonia removal by the nitrifying microbes.

Step #3: Use **MICROBE-LIFT®/KH Test Kit** to test the levels in your pond.

Step #4: Use **MICROBE-LIFT®/KH Booster** to supply the necessary carbonate alkalinity required by nitrifying microorganisms. If carbonate alkalinity is NOT present, the pond pH will be unstable and ammonia removal may cease.

MICROBE-LIFT®/PL and Denitrification

MICROBE-LIFT®/PL provides a real value to your pond's environment. In addition to being one of the BEST products you can use to speed the removal of unwanted, slow-to-degrade organic matter from your pond environment, the novel cultures in **MICROBE-LIFT®/PL** assist in the removal of nitrate from pond water via a process called *Denitrification*.

While some pond nitrate is removed by plants and partial water changes, the most effective way to control nitrate removal is by biological denitrification. In this process, nitrate removal takes place in the anaerobic areas, such as those found in pond filter bio-films. **MICROBE-LIFT®/PL** cultures are also *denitrifying microbes* that provide an important nitrate removal pathway assisting in the removal of nitrate via denitrification. **MICROBE-LIFT®/PL** includes high-rate denitrifiers that convert nitrate to nitrogen gas under an anaerobic condition that exists in filters and pond surface bio-films, reducing the nitrate level in your pond. It is noteworthy that algae can use nitrate as a nutrient.

MICROBE-LIFT®/PL & MICROBE-LIFT®/Nite-Out II are the answer to a Natural, Clean, Clear NON-TOXIC Pond Environment! You can rely on these two novel, biological products to enhance water quality by removing slow-to-degrade waste matter, and removing and controlling ammonia, nitrite and nitrate via their natural, non-chemical biological process.