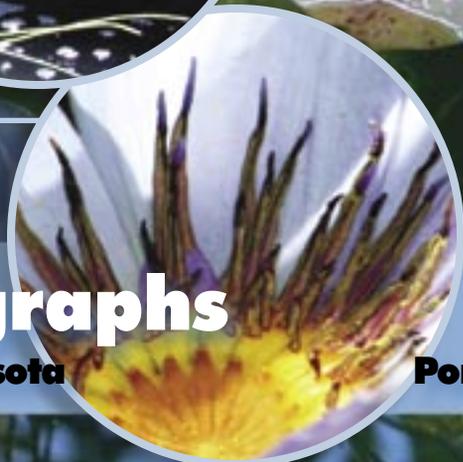


the **MICROBE-LIFT**[®] watergardener

VISIT US AT
www.microbelift.com

the *green way*
to **reduce nitrates**



Basic
WATER PARAMETER
Testing

HOUSEHOLD AMMONIA
to Cycle a Filter in the Absence of Fish

GUIDELINE
for using
MICROBE-LIFT[®]
Products

Photographs

from the Sarasota

Pond Tour

Navigating the
MICROBE-LIFT[®]
Website

What do they have in common?



It may seem that the **leading pond water clarifier** would have *nothing* in common with **the world's leading soft drink**. Well, except for the fact that they are both liquid, there is something else! Coca-Cola's competition is always making claims to be better than Coke. The reason they do this is easy to understand: it's because many people feel that **Coke® is THE BEST soft drink** and **the standard** by which **all other soft drinks are measured**.

Over the last four years, several new biological products have been introduced by our competition, all making the *same claim*: that *they* are better than MICROBE-LIFT®! Some have even made the statement that the bacteria in MICROBE-LIFT® are DEAD!

Well, we are very flattered that **people use MICROBE-LIFT® as the standard for our industry!** And, as for the negative comments about MICROBE-LIFT®, everyone knows that no good salesperson or company with a good product badmouths the competition. In fact, many of our customers believe that companies using unprofessional sales tactics like these lose credibility because, regardless of what they may say or claim, **MICROBE-LIFT® is the #1 selling and BEST bacterial product** because **it works better** than *any other* bacterial product on the market. We can also say, based on the false statements made, the competition doesn't understand the technology behind MICROBE-LIFT®/PL. View it for yourself...

Mark J. Krupka

MARK J. KRUPKA, VP/TECHNICAL DIRECTOR
MEMBER, AMERICAN SOCIETY OF MICROBIOLOGY (ASM)



Ecological Laboratories INC.
www.microbelift.com • Call 800.645.2976

Go to **www.microbelift.com** and **view first hand** just how active our so-called "dead" bacteria are in the **bottle!** Under our digital video camera equipped microscope, we **show you the vibrant activity** exhibited by **MICROBE-LIFT®/PL just minutes** after taking a sample from the bottle. We also show just how **nonrobust and inactive the competitor's** products are **even hours** after taking them from their bottles. That's because most are limited to **Bacillus** species that *don't* give you the robust performance of **MICROBE-LIFT®'s broad spectrum of organisms.** We've even tested that new product claiming to be the "Heinz+ One" of bacterial products with **58 different species of bacteria**, and guess what we found...primarily the same **three Bacillus blend** that everyone else has!

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While it is our goal to provide an open forum to express the various opinions and ideas for water gardening, the views expressed in the articles are the opinions of the articles' authors and not necessarily the views of Ecological Laboratories, Inc.

Featured



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about the editor

Carolyn is the Consumer Relations Manager of Ecological Laboratories, Inc. and liaison to koi and water garden clubs in the U.S.A. and Canada. A retired social worker and long-time hobbyist, Carolyn has authored many articles for well-known magazines on all phases of the art of pond keeping and has twice been awarded “Koi Person of the Year”. She has been a regular columnist for *Water Gardening Magazine*, writes the Q&A column for *MacArthur Water Gardens*, Boca Raton, FL, and is the Editor for *Mid-Atlantic Koi Club Magazine*. In her spare time, she is enjoying her new Florida home and 4,000+ gallon pond.

editor's letter



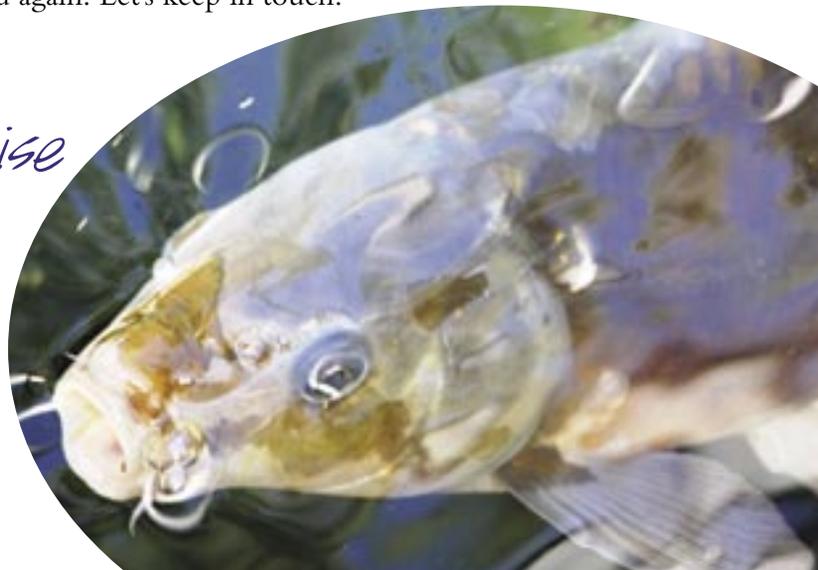
Hi, everybody! I've gotten such positive feedback about our little magazine that we want to continue to treat you to updated information at least twice a year. We will not print any more hard copies. I know that I had said

the **Spring/Summer MICROBE-LIFT® WATERGARDENER** would be printed, but the time and materials saved by using electronic publications has far outweighed any other considerations. You may choose to print articles from the magazine(s) on your own home printer to carry with you from room to room, as one reader mentioned. We only ask that you do not waste paper printing what you do not intend to keep. By “going green”, you know, we are united in the effort to save our planet!

In this issue, I have included some articles that cover **FAQs (Frequently Asked Questions)** more in depth, with detailed *Answers*, such as explaining how great it is to cycle the pond or quarantine tank **BEFORE** you add your fish. And our newest pond products, **MICROBE-LIFT® / SABBACTISUN™** and **MICROBE-LIFT® / PARAZORYNE™** — **herbal water treatments** for bacterial and fungal disease or parasite-caused problems — have been met with *overwhelming* response! Many people *marvel* at all the *incredible* information they find on our website, while others think it's “too complicated” and would like to know how to better use it! So, I've included an article to help you to navigate the **MICROBE-LIFT®** website. And that's just for openers! As photography is *my* special passion, I do hope you enjoy the featured photographs, chosen with you in mind! Personally, I don't usually read magazines, I look at the pictures! But, if a picture or photograph catches my eye, it just might entice me to learn something and read the article to which it is attached!!!

So glad to see you again! Let's keep in touch.

Your Editor,
Carolyn Weise
Carolyn Weise



PHOTOS by CAROLYN WEISE

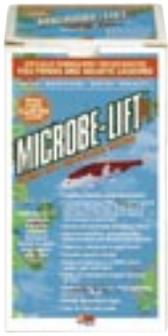


by
Mark Krupka

the *green way* to reduce nitrates

*i*N AN ARTICLE PUBLISHED IN SEVERAL PUBLICATIONS put out by various Koi clubs across the country last year, the author declared that, contrary to popular belief, nitrates could reach toxic levels in a pond and, also, that water changes were the only way to remove nitrates from a pond. I agree with him on the first count, although the nitrate levels have to get pretty high before toxicity is experienced. However, not only are water changes not the only way to reduce nitrates, but they are not even the best way to reduce nitrates. At a time when everyone is looking for a 'green' way to do everything, the biological approach to nitrate reduction is the *greenest* way possible.

What does it mean to approach something in a 'green' way? It typically means that something is done in a way that does the least amount of environmental damage, while at the same time minimizing the use of natural resources, renewable and non-renewable. While water changes do little or no damage to the environment, in most cases, thanks to dilution, it does consume a lot of water. For example, if someone has a 5,000 gallon pond and does a 20% water change, that is 1,000 gallons of water. That is what an average family consumes in three days in the U.S. and what some families would use in a month or more in certain underdeveloped countries.



MICROBE-LIFT® / PL



MARK J. KRUPKA
ECOLOGICAL LABORATORIES, INC.
VP/ Technical Director

Mark received his Bachelor's Degree in Microbiology in 1975 and completed graduate work in Marine Microbiology and Biochemical Engineering at Rutgers University. His experience includes over 26 years performing pilot and full-scale studies to assess the treatability of organic waste streams, lagoons, ponds, and fish farms. Mark has extensive experience in the design, operation and control of biological systems as well as the function of microbes in natural aquatic environments. He recently organized and oversaw the successful remediation operations with MICROBE-LIFT bacteria products in the Xiba River, China.

In the April '09 *Water Garden News*, Mark was named "one of the most influential people in the industry over the previous decade". Mark has published numerous articles and technical papers on environmental microbiology, aquatic ecosystems, pond ecosystems, biological wastewater treatment processes, strain selection, bioaugmentation and bioremediation.

continued

PHOTOS by CAROLYN WEISE



Many hobbyists have a good understanding of nitrification, the first half of the nitrogen cycle. However, denitrification, the biological reduction of nitrate to nitrogen gas and another key segment of the nitrogen cycle is not only not well understood, many people don't even know about it.

To denitrify requires primarily three things: a carbon source, an anoxic environment, and a bacterial population that is capable of expressing the necessary enzyme for denitrification to occur, namely nitrate reductase.

Typically, having the carbon source for denitrification is not that hard. Organic fish waste, uneaten fish food, etc. are usually enough to provide the necessary carbon source. Next: the anoxic environment. Most people feel that this is impossible because they believe that if they have an anoxic environment in their pond, their fish will likely die, and they'd be right. However, you *don't* need an anoxic environment throughout the pond! What you need are anoxic zones, such as in the biofilm on the media in a filter or skimmer, or in the bottom substrate. These anoxic zones are usually enough to provide the environment necessary to remove all of the nitrate generated in a typical pond.

Finally, you need a bacterial population with an organism capable of effecting denitrification. Well,

continued



*“I've ordered the MICROBE-LIFT®/PBD,
will begin using it as soon as it arrives
& will follow with MICROBE-LIFT®/HC &
MICROBE-LIFT®/SA as water temps rise.
I love the MICROBE-LIFT® PRODUCTS
& am very IMPRESSED
with your customer service!”* — TAWANA

MICROBE-LIFT® Cycles Fish Ponds Fast

Understanding The Nitrogen Cycle & Your Pond!

Gaseous nitrogen into the air
Nitrogen Gas (N₂)



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 (NO₃⁻)
A food source for plants and algae

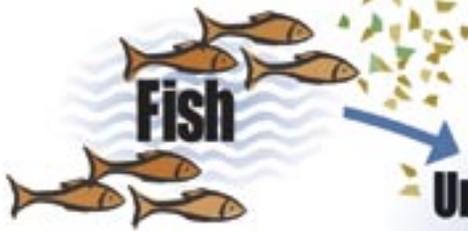


Nitrobacter sp. & Nitrospira sp.
MICROBE-LIFT/NITE-OUT II (already added in step #2) provides the necessary Nitrobacter and Nitrospira bacteria required for the oxidation of nitrite to nitrate in the pond filter!



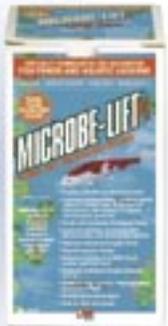
2 steps to speed the removal of organic waste, ammonia and nitrate for a clear, clean, nontoxic pond!

Fish



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

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.

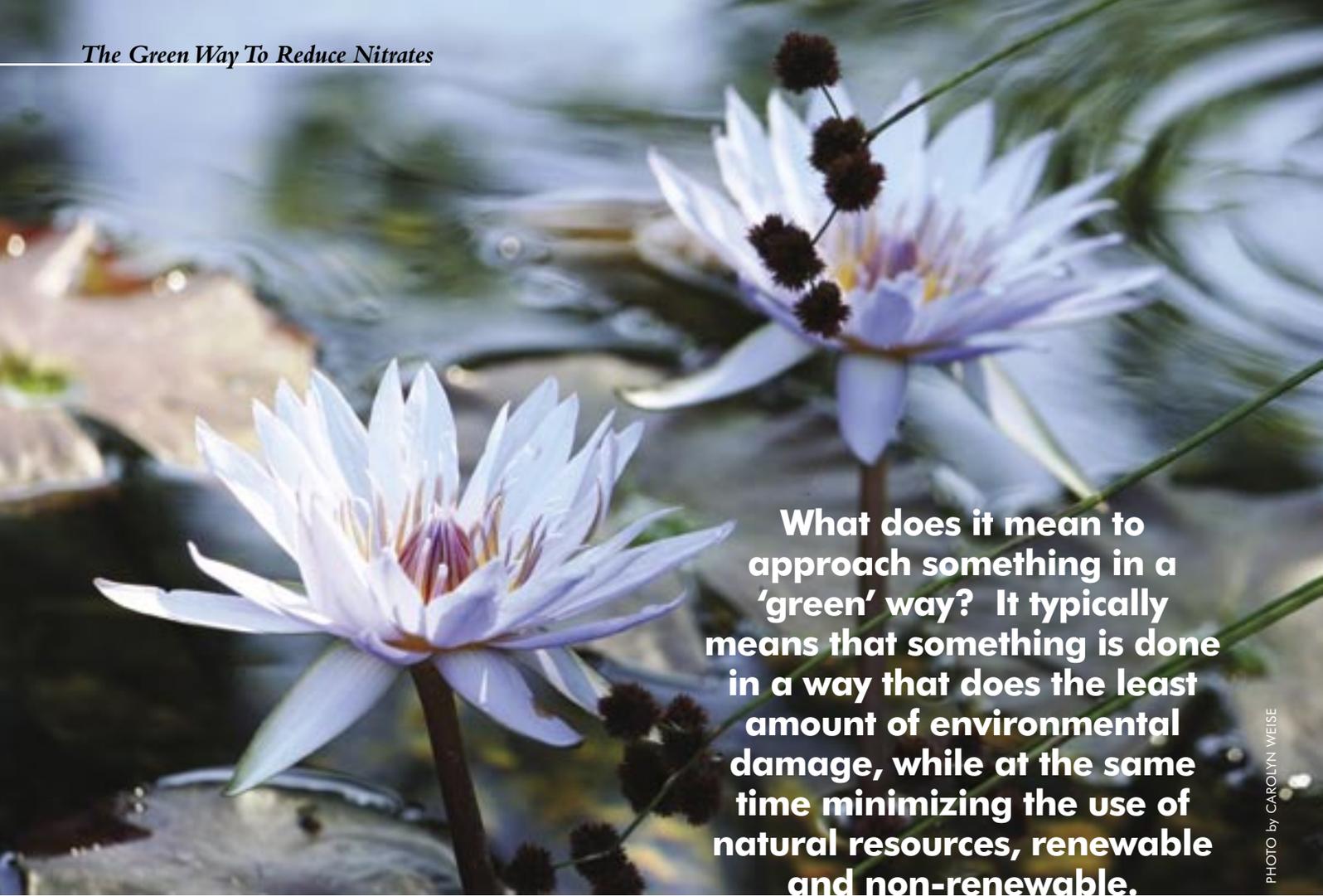


step #2: add ML/NITE-OUT II
Provides the necessary nitrifying bacteria (Nitrosomonas sp., Nitrobacter sp. and Nitrospira sp.) required for the biological nitrification process and also assures continued removal of toxic ammonia!



Nitrosomonas sp.
(contained in ML/NITE-OUT II) converts ammonia to **Nitrite (NO₂⁻)**

Manufactured by
Ecological Laboratories, Inc.
Providing Aquatic Solutions Since 1976
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What does it mean to approach something in a 'green' way? It typically means that something is done in a way that does the least amount of environmental damage, while at the same time minimizing the use of natural resources, renewable and non-renewable.

PHOTO by CAROLYN WEISE

MICROBE-LIFT®/PL, MICROBE-LIFT®/HC and **MICROBE-LIFT®/PBL** (for ponds) and **MICROBE-LIFT®/SPECIAL BLEND** (for aquariums) ALL have a few very effective denitrifiers that will lower and keep your nitrates below 1.0 mg/L. Last summer, an aquarium customer (who wasn't aware that our **MICROBE-LIFT®/SPECIAL BLEND** for aquariums could denitrify) called about high nitrates —160 mg/L!!! Now *that* is in the potentially toxic range. He added the initial high dose of the **MICROBE-LIFT®/SPECIAL BLEND**. The next day he called and reported that his nitrates had dropped to less than 20 mg/L overnight!!! He could not believe it. And the best part: no adverse environmental effects at all. The nitrogen gas bubbles harmlessly into the air. Will that pollute the air? *Not at all*. The air we breathe is approximately 78% nitrogen.

While water is relatively inexpensive in the U.S., in Europe, where water is more expensive, the denitrification aspect of **MICROBE-LIFT®/PL** is one of the major selling benefits over there. The product pays for itself several times over with the savings in the cost of water changes. Plus, the users get all of the other benefits as well.

With everyone wanting to be a little more environmentally responsible we should be selling that benefit a little more in the U.S. It may not sound like much. What is a 200 gallon per week savings for a 1,000 gallon pond? Well, let's say that there are 5,000 ponds in the U.S. (and I know there are more, but this is just for argument's sake) and each pond owner saved 600 gallons per month by cutting water changes from once per week to once per month. In the course of a year, that would save 36 million gallons of water. Certainly, not a drop in the bucket. 🌱



HOUSEHOLD AMMONIA

to Cycle a Filter

IN THE ABSENCE OF FISH

by Roddy Conrad

FIRST LET'S GO THROUGH THE MATH & then I will come back to discuss a few "simple rules" for the use of (non-sudsing type) Household Ammonia to cycle a filter, or keep biofiltration bacteria in food in the absence of fish. Here are my general rules for this endeavor:

- Keep the water in the 0.5 - 10 PPM ammonia range to keep the biofiltration bacteria happy. Going above 50 PPM may make the bacteria too gorged and give them health problems.
- After you have used household ammonia to keep biofiltration bacteria happy in the absence of fish, wait until the ammonia measures below 1 PPM before putting the fish back into the pond.
- For each 1000 USA gallons of water, add 1 pint (2 cups) of household ammonia for each 5.5 PPM ammonia charge to feed the bacteria. Expect this charge to last 1-3 days, and add more when your test kit indicates ammonia is less than 1 PPM. Measure the ammonia level to make sure the bacteria are eating the ammonia, meaning: do not continue to add ammonia if the bacteria have not converted the last 5.5 PPM charge. Or, if you want to add less ammonia, it requires 86mL of the household ammonia for each 1 PPM ammonia charge to 1000 gallons. (86mL multiplied by 5 gives 430mL /1 pint is 473mL or a 5.5 PPM ammonia charge).
- For each USA gallon, add 2 drops of household ammonia (for each 1 PPM ammonia you want to charge) in a glass aquarium.
- For a 10-gal. glass aquarium, better than counting drops is to use a 1mL syringe and add 1mL of the household ammonia to each 10 USA gallons for each 1.2 PPM ammonia you want to add to the aquarium.

continued

Household Ammonia To Cycle A Filter In The Absence Of Fish

- For water volumes in the 29-500 gallon range, buy a little blister pack of the little plastic cups sold in the pharmacy that are marked at 10mL, 20mL and 30mL volumes. Then do the following:

- a) Add household ammonia at the 10mL mark to a 29-gal. aquarium to add 4 PPM ammonia to feed the bacteria for a couple of days (usually).
- b) Add household ammonia at the 30mL mark to each 100-gals. of aquarium or pond volume for a 3.5 PPM ammonia addition to the 100-gals. of water.
- c) For 300-gallons, fill to that 30mL line three times now you have 3.5 PPM ammonia, enough (usually) to feed the biofiltration bacteria for a day or so.

- Assume a USA gallon of water is 8.33 lbs. of water (which, multiplied by 454 grams per gallon equals 3,782 grams of water). 3,782 grams divided by a million (or 1,000,000) gives us 0.00378 million grams of water. To get 1 PPM ammonia in a gallon of water, then, we need to add 0.00378 grams of pure ammonia.

- Household ammonia is 8 - 10 weight % ammonium hydroxide. Let's assume it is 9% for purposes of calculations. Also, the molecular weight of ammonium hydroxide (NH₄OH) is 35, while the molecular weight of ammonia itself is 17. So 17/35 multiplied by 9% gives us an ammonia content of household ammonia of 4.37%.

- We need 0.00378 grams of pure ammonia charge in a USA gallon of water to charge 1 PPM ammonia, and household ammonia is 4.37% pure ammonia content, so dividing 0.00378 grams by 0.0437 gives us a need to add 0.086 grams of the household ammonia to a gallon of water in order to add 1 PPM ammonia to it. Each gram of household ammonia contains about 20 drops, so each drop of household ammonia would be approximately 0.05 grams (1/20 of a gram). We want to add 0.086 grams of ammonia to that USA gallon to get 1 PPM, so $0.086 / .05 = 1.7$ drops of household ammonia to add to a USA gallon to put in 1 PPM ammonia charge.

- Multiply that times a 10-gal. aquarium and you find you will need 17 drops of household ammonia, or 0.86mL in a 1mL

syringe to add 1 PPM ammonia to a 10-gal. aquarium.

- Multiply that times 29 and you find you'll need 2.5mL, or 2 full 1mL syringes full, — plus half a syringe — to add 1 PPM ammonia to a 29-gal. aquarium.

- For a 100-gal. pond, you need 8.6mL, so use a 30mL little plastic cup from your local pharmacist (used for measuring medicine dose charges with calibration lines at 10mL, 20mL and 30mL) and fill it to about the 10mL line to add slightly more than 1 PPM ammonia. (Pharmacists sell these little plastic cups in blister packs of 10 or so for a very low cost).

- For a USA 300-gal. pond, go to about the 30mL line in that little plastic cup for each 1 PPM ammonia to add to the pond.

- For each 1000-gals., you want about 86mL for each 1 PPM ammonia charge. (Now you can use the 100mL line on a regular household measuring cup!)

*Enough chemistry for the day!
Now, back to the regular
ponding schedule...*

PLEASE... no peeing in the pond!!! Household Ammonia is a *much better* choice for the same purpose! The issue with "urine" in the pond water is the buildup of urea, which can cause ammonia spikes much later, *after* you have added the fish from uncontrolled urea hydrolysis... and possibly causing fish deaths.

Biobugs that neutralize nitrites are notoriously picky: they're the last to develop a suitable colony and the first to die off if you sneeze in their general direction! It appears that the more initial ammonia (within reason), the better the colony develops. Earlier experiments I did took WEEKS to develop when I only used 1 or 2 PPM of ammonia.

Finally, once you have your colony developed, don't forget to feed it every other day or so (*check with your test kit and "refill" as you start to drop towards the .5 PPM level*) and do water changes to keep everything "fresh"... or you won't like the smell very well!

Any other questions?! 🌱

"There is a lot of bad advice online & I was ready to quit"

*But with MICROBE-LIFT™
I've FOUND THE TRUTH!"*
— JACQUELINE SANTZ, MA



PHOTO BY CAROLYN WEISE

BASIC WATER PARAMETER TESTING

PHOTO by CAROLYN WEISE

WHEN TO TEST

INDIVIDUAL, ONE-TIME TESTS are only important if the test results indicate a toxic or dangerous condition, such as high ammonia, where corrective action has to be taken *immediately*. The greatest benefit of testing, however, is obtained when results are plotted on graph paper over a period of several tests, so that trends or directions can be noted early. By knowing the direction your pond's water quality is taking, you can take corrective action *before* a potential problem gets out of hand.

pH

A measurement of the free hydrogen ions in the system. pH is measured on a scale of 1 to 14. Stay above pH 7.0 for best results with Koi. At higher pH values, ammonia is more toxic. pH can "crash" to 5.5 overnight due to fish, plant and bacterial activity without adequate buffering of water — fatalities result. (See **Hardness and Alkalinity** below). Acceptable pH range for fish is 7.0-9.0 and most important is to minimize pH fluctuation within this range, not to chase a magic number using chemical additives.

Ammonia (NH₃)

Target range for ammonia is 0. Max recommended is 0.25ppm. Ammonia comes from fish exhalation, urine and rotting feces. High levels of ammonia cause redness of fins, general poor health, excess mucus production, flashing, and by chronic auto-intoxication: Pinecone disease. Ammonia is more toxic at pH above 8.0. Ammonia is removed from the environment by beneficial bacteria called "Nitrosomonas". You can control Ammonia with a "balanced pond", partial water changes or addition of Zeolite.

There is a big difference between **Total Ammonia** (the sum) vice **Free Ammonia** and **Bound Ammonia** (the parts of the sum). What most of us want to know is what the **Free Ammonia** level is in our pond. It is the **Free Ammonia** that is going to do the most damage to the gills of our fish and eventually cause death if not countered.

TWO MOST COMMON TYPES OF AMMONIA TEST KITS

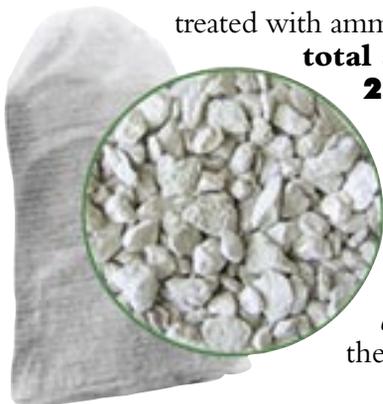
1. Nessler reagent type test kit, which is a one step, quick reacting test. It is fine for untreated water, but gives false readings in water treated with ammonia binders (like Amquel). These kits read **total ammonia only**.

2. Salicylate reagent type test kit, which is a two step/part test kit and slower to react to give final readings. Again, these kits read **total ammonia only**.

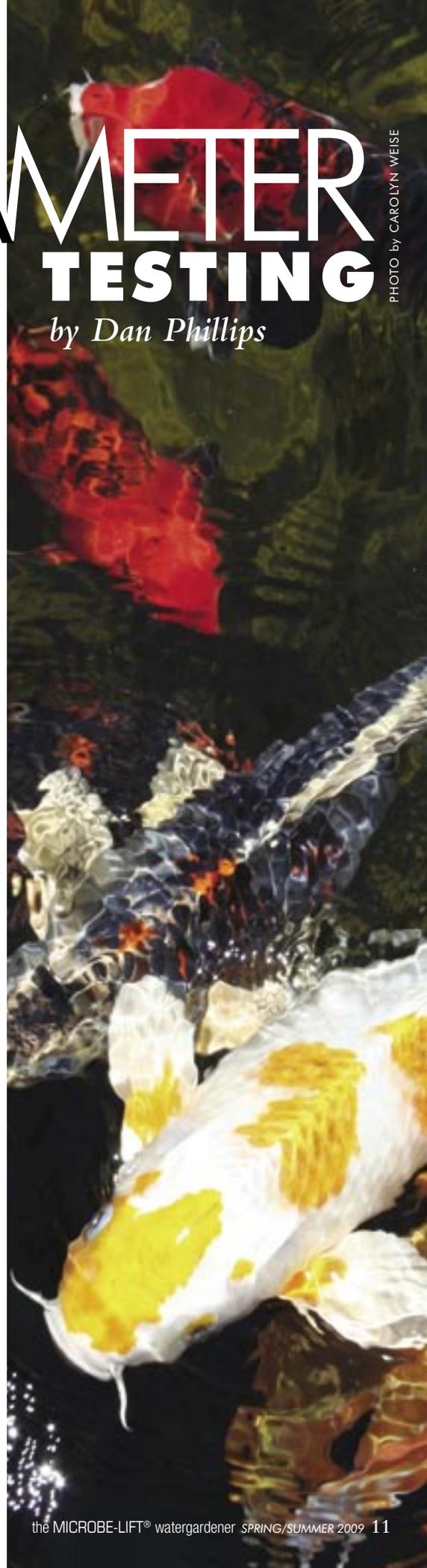
WHAT TYPE DO I HAVE?

The easiest answer is that the Nessler test is *clear when negative and turns yellow when positive*; the Salicylate test is *yellow when negative and*

continued



MICROBE-LIFT®/ ZEOLITE



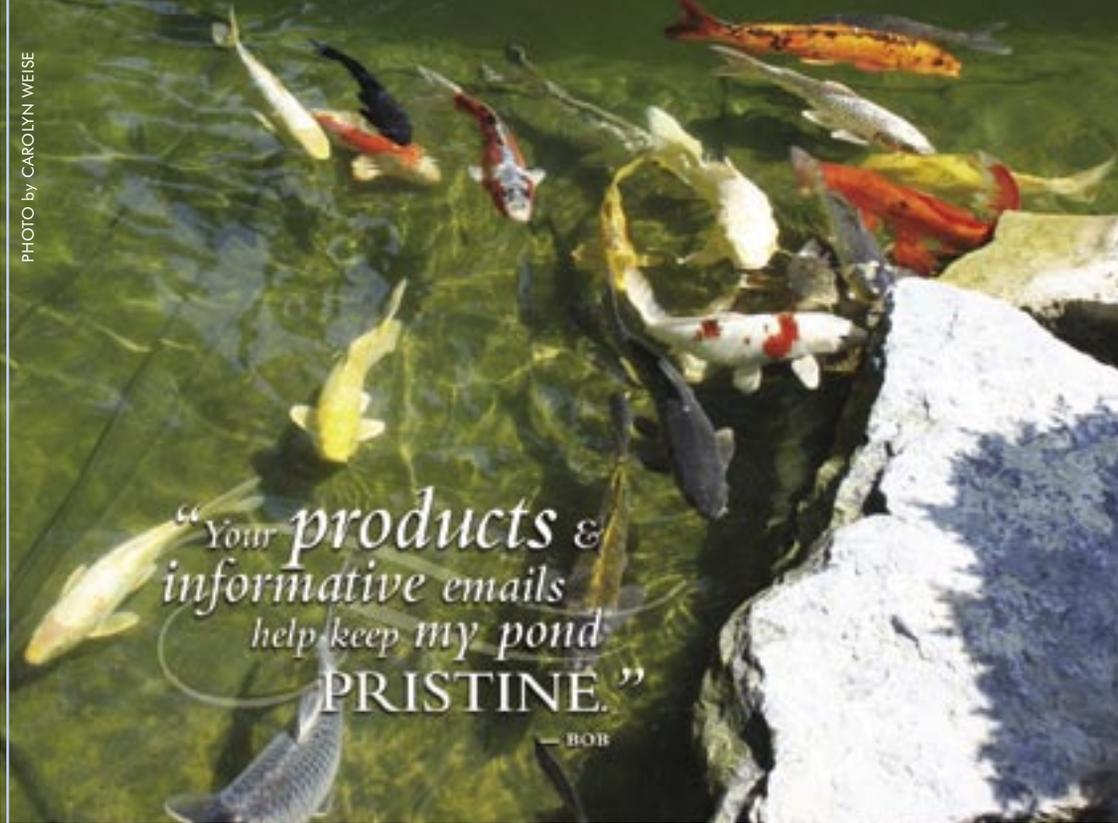


DAN PHILLIPS

NORTH CAROLINA KOI & WATER GARDEN SOCIETY

Dan is an Engineer and writes telecommunications software. Dan has been in the koi hobby for twelve years. For the last seven years, he served as an officer in North Carolina Koi & Water Garden Society. In 2004, he was KHA certified and is a regular health advisor, article contributor for prominent hobbyist magazines. He is working on his third dream koi pond — 23,400 gallons plus filtration — at his home. Dan is totally “Koi Kichi” and enjoys attending, working and showing at koi shows. Plans for a trip to Japan during Fall harvest are in the works.

PHOTO BY CAROLYN WEISE



turns green when positive. Most of these test kits will have their readings affected by ammonia binding chemicals. Good test kits give true total ammonia readings in the presence of Amquel, Prime or similar products. These types of products (and others like them) are Chlorine/Chloramine neutralizers, but also contain ammonia binders that will interfere with normal Nessler test kits, causing false readings.

Nitrite (NO₂)

Target range for Nitrite is 0. Max recommended is 0.25ppm. Nitrite is less toxic than ammonia, but still very toxic because it inhibits the ability of the blood to carry oxygen. Ammonia is converted to Nitrite by Nitrosomonas and Nitrite is oxidized into Nitrate by Nitrobacter bacteria living in your pond & filter. If the Nitrite level is elevated according to your test results, make a partial water change and add bacteria high in Nitrobacter. Nitrite toxicity is temporarily reduced by the addition of salt at 8 pounds per 1,000 gallons (0.1%).

Nitrate (NO₃)

The end product of the nitrifying phase of the nitrogen cycle. It is much less toxic for koi than either ammonia or nitrite. It is, however, a nitrogen compound that is the food and fertilizer for algae/plants. Partial water changes of 1/10th per week will flush out accumulating Nitrate. Acceptable range is 20-60ppm (the lower the better). If the Nitrate level is over 60 ppm as indicated by a test, water changes are recommended. Nitrate is toxic to koi above 120ppm. Elevated levels of Nitrates stunt koi growth and slow wound healing.

GH: General Hardness

Measures the water's buffering capacity in terms of “units of carbonate buffering capacity.” General Hardness is a number, which combines Hardness (mineral content) and Carbonate activity. Desired level for koi —100ppm (GH and KH). CaCl (Calcium Chloride) can be used to quickly raise (General) hardness. **See Oyster Shell below.** Be careful, very high GH levels can sometimes cause shimmies (black freckles) in the hi of (pre-disposed) kohaku.



MICROBE-LIFT®/ AMMONIA REMOVER
MICROBE-LIFT®/ PHOSPHATE REMOVER

KH: Carbonate Hardness

Basically the GH (General Hardness) with the mineral number subtracted, leaving carbonates (i.e. **See Total Alkalinity below**). Harder water allows koi to ease up on osmoregulation and therefore reduces stress.

Total Alkalinity

Alkalinity could be described as the “intensity of pH”. Addition of **Baking Soda** (Sodium Bicarbonate) results in a higher Carbonate Alkalinity (i.e pH Buffer), but does nothing to Hardness.

continued

Basic Water Parameter Testing

Check Total Alkalinity before its use, though. (Use one teaspoon per ten gallons if the TA <100ppm). **Oyster Shell** is nothing but Calcium Carbonate and Magnesium Carbonate. When the Oyster shell dissolves due to the presence of acid water, it liberates Calcium, Magnesium, and Carbonates. These mineral liberations increase the hardness of the water (contributing nothing to Buffering capacity) and the Carbonates increase the Alkalinity. Thus, the pH is stabilized. Your water will be clearer with a higher Total (carbonate) Alkalinity. **Plaster of Paris** can be used to make a "pH pill" or puck of white chalky material you can toss into the pond, and it will slowly dissolve, liberating carbonates, Calcium, Magnesium and gypsum. The dissolution of the "pH pill" increases hardness, alkalinity and more in the water being treated. **All of the above will also increase pH.**

Dissolved Oxygen (DO)

Dissolved oxygen is usually only a warm weather concern, as it is associated with water temperature and algae. However, the larger the koi, the greater the oxygen demand. Low levels will stress and kill your biggest koi. The colder the water, the greater its capacity to hold dissolved oxygen (and vice versa). Algae/plants take up oxygen at night, but create it during the day. The time of day with the lowest dissolved oxygen in the pond water is early morning. Beware if your pond is heavily stocked with koi, you have lots of plants, in the middle of a Summer heat wave and your power goes out (especially at night). It's a combination which can quickly spell disaster for koi.

The recommended minimum level of oxygen in a koi pond is 8 ppm (complete saturation is 14ppm). Temporary minor fluctuations below this should cause few problems providing other water quality parameters (pH, Ammonia and Nitrite) are acceptable. However a permanent value below 8 ppm is destined to cause koi health problems. Koi will survive for a few days at 5 ppm, but if the oxygen concentration drops to 3 ppm the fish will start suffering severe oxygen shortage, and will soon die of hypoxia. Should you record a dangerously low concentration of dissolved oxygen in your pond there is a temporary solution to get you out of trouble until the cause of the shortage can be found out. A solution of 3% hydrogen peroxide should be squirted into the pond just under the water surface. Carefully decant the solution into a spray bottle, or preferably use a spray atomizer attachment that will fit onto the peroxide bottle. Use roughly 60 squirts per 86 gallons (388 L) of pond water. This is a laborious process in large ponds but will raise the oxygen levels giving your koi and filters vital oxygen, and giving you roughly 4 hours to get the oxygen levels back up by more conventional means. Do not apply the chemical on or near the fish or gill damage will occur. Do not rely on this process regularly. If oxygen shortage is a consistent problem, then buy an air-pump or venturi. Hydrogen peroxide is great for emergencies, and should only be used as such.

Temperature

Koi can **survive** in water temperatures from 32°F to 95°F, but are stressed at the extremes. Koi can **thrive** in water temperatures from 50°F to 80°F.

Salt

0.1% helps koi with osmoregulation (8 pounds per 1,000 gallons). As little as 0.05% will begin to kill some (anacharis) pond plants, although some (lilies) are unharmed at 0.2%. If using zeolite to reduce ammonia, beware when adding salt. As salt is used to recharge zeolite and will cause it to release all its ammonia back into your pond. 🌱

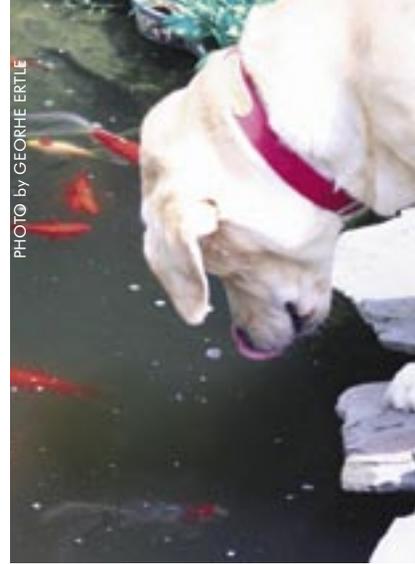


PHOTO BY GEORGE ERTL

*"Thanks so much for your
PERCEPTIVE help —
even more for the
EXCELLENT products
MICROBE-LIFT® gives us."* — JOHN



2 BOTTOM PHOTOS BY CAROLYN WEISE



MICROBE-LIFT® / TEST STRIPS:
5 IN 1,
CHLORINE/CHLORAMINE,
AMMONIA,
NITRATE/NITRITE
& PHOSPHATE

Stop the Press!

MICROBE-LIFT®/Sabbactisun™ & MICROBE-LIFT®/Parazoryne™ are here!!!

WE'VE BEEN TALKING about these two Herbal Water Conditioners since 2008, but the wait is over.

You no longer need to treat your pond fish with antibiotics, which also eliminates Nitrifying bacteria at the same time, therefore creating the need for daily water changes to prevent toxic ammonia poisoning. Now, you can continue feeding as normal, filtering as usual, and simply treat the fish without worry. Another amazing benefit: parasites and bacteria will not build up resistance to MICROBE-LIFT®/SABBACTISUN™ and MICROBE-LIFT®/PARAZORYNE™! And, although a hospital tank or quarantine system will naturally be more economical, no matter what type of treatment you use, MICROBE-LIFT®/SABBACTISUN™ and MICROBE-LIFT®/PARAZORYNE™ can be safely used in show and

breeding situations and ponds.

You will want to use READY-TO-USE (RTU) MICROBE-LIFT®/SABBACTISUN™ for symptoms such as fin and tail rot, mouth rot/fungus and dropsy (ascites), ulcers, and wounds. Use the RTU MICROBE-LIFT®/PARAZORYNE™ for fish recovering from skin flukes (Gyrodactylus), gill flukes (Dactylogyrus), Ich, Oodinium, Costia, Chilodonella and Trichodina. These are not disinfectants and will restore the natural balance, helping fish to fight off infection, parasites and more. These are the products which give your fish the edge needed to fight infections and win! Both products also come in CONCENTRATED forms for larger systems. Be sure to treat for 10 days because parasites reproduce within that period of time and we want to "starve" as many as possible before successful completion of treatment.



Concentrates & RTUs of MICROBE-LIFT®/PARAZORYNE™ & MICROBE-LIFT®/SABBACTISUN™

more testimonials

"Last year, I tried MICROBE-LIFT®/PL GEL... love it!

This Spring, used the MICROBE-LIFT®/PL.

*I have not turned on the UV light yet!
clear water;
happy fish!*

*If I didn't see it,
wouldn't have believed it!*

— JACKIE NANTZ, N.C.



*"It is refreshing to see
an ONLINE COMPANY
that has REAL
customer support."*

— TIM B.

*"Whenever doing a
water exchange,
I always add
MICROBE-LIFT®/
DECHLORINATOR PLUS."*

— WILL



*"...SERVICE
above & beyond..."*

— ROBERT

*"I don't know
what I'd do without
MICROBE-LIFT®/PL.*

It is THE BEST." — ANN

GUIDELINE *for using* MICROBE-LIFT® PRODUCTS

SPRING

water temperatures 45°F & above:

MICROBE-LIFT/PL • for rapid filter & pond biology & removes nitrate

MICROBE-LIFT/Nite Out II • needed to start nitrification

Always add ML/PL & ML/Nite Out II at the start of the season & after filter cleaning

ML/SPRING/SUMMER CLEANER • for any leftover leaves

ML/SUPER START FOR BEAD FILTERS • quick-start bead filtration

ML/TAC, ML/MC+ • or any of the ML spore-based bacteria (if used)

ML/BARLEY STRAW PELLETS+ or ML/BARLEY STRAW CONCENTRATED EXTRACT • both can be used at any temperature

water temperatures 50°F & above:

begin feeding ML/LEGACY COLD WEATHER (WHEAT GERM)

LATE SPRING/SUMMER

water temperatures 55°F & above:

MICROBE-LIFT®/PL

MICROBE-LIFT®/SLUDGE AWAY • speeds up removal of bottom solids/sludge

ML/LEGACY COLD WEATHER (WHEAT GERM)

& as water temperature warms to 60°F & above:

add ML/LEGACY FRUITS & GREENS
ML/LEGACY GROWTH & ENERGY
ML/LEGACY IMMUNOSTIMULANT FOODS
& MICROBE-LIFT®/LEGACY TREATS

return to ML/LEGACY COLD WEATHER (WHEAT GERM)

when/if water temperatures reach 80°F

& stop all food if water temperatures reach 85°F+

If ammonia & pH problems are encountered, check carbonate alkalinity; if low, increase carbonate alkalinity to achieve an adequate level & then add NITE OUT II to restore nitrification. If bottom sludge develops, add MICROBE-LIFT/SA in combination with MICROBE-LIFT/PL.

FALL/WINTER

water temperatures are down to 55°F again:

MICROBE-LIFT®/AUTUMN WINTER PREP

MICROBE-LIFT®/POND SALT • for 3-week pre-dormancy treatment



*“I used
MICROBE-LIFT®/
ALGAWAY 5.4
last year for string algae.*

*By far, the BEST product
I used in 3 years, & believe me,
I tried most of them!”*

— MICHAEL

*“I’m just calling to
thank you for your
EXCELLENT ADVICE.*

*We live in New Hampshire &
restored a 1/4 acre pond*

*a few years ago & were having
nothing but problems.*

My husband wanted to

FILL IT in last summer!

*We followed your advice using
MICROBE-LIFT®/PL, SA,
BARLEY STRAW PELLETS+*

& PBD & are just

thrilled with the results!

We are just SO happy!

*The WILDLIFE is thriving;
the pond is clear & such a
JOY!”*

— NANCY WERNER, NH



ML/SPRING/SUMMER CLEANER; ML/SUPER START FOR BEAD FILTERS; ML/TAC; ML/BARLEY STRAW PELLETS+; ML/BARLEY STRAW CONCENTRATED EXTRACT; ML/LEGACY COLD WEATHER (WHEAT GERM); MICROBE-LIFT®/SLUDGE AWAY; ML/LEGACY GROWTH & ENERGY; MICROBE-LIFT®/LEGACY TREATS; MICROBE-LIFT®/AUTUMN WINTER PREP; and MICROBE-LIFT®/POND SALT



CAROLYN WEISE

ECOLOGICAL LABORATORIES, INC.
Customer Relations Manager and
Liason to Pond & Water Garden Clubs (U.S. & Canada)

Carolyn has kept fish her entire life, starting with guppies in a bowl, progressing to breeding specialty tropicals (gold blush & marble angels), and all the way to in-ground aquaria, outside; from salt water marine, to her "wild" tanks with newts, turtles, goldfish and whatever seemed natural in a vivaquarium set-up. As an old beachcomber, water has been a constant companion and source of comfort in Carolyn's life.

After buying her first koi in 1990, life has never been the same! A mother and grandmother, a retired social worker, and, mostly, being a homeowner gave her the time and opportunity to delve into the hobby, with both feet! The first pond — a tiny preformed 4' x 6' — was given to her. The next preformed was a bit larger at 6' x 8' and, with more lawn dug out, was laid side-by-side next to the first! Then, around 1997, when she won a 20' x 30' liner at the MAKC Hofstra show, she sold her car to pay for the filters! Four years later, and many more koi, Bob BonGiorno of Suburban Water Gardens installed the coup d' grace — a 6,000 gallon, 6' deep combination koi pond and water garden with lots of trimmings.

Carolyn attended SUNY at Farmingdale, Ornamental Horticulture before transferring fields and receiving a BA and MA in the field of social work. She credits her ponds for keeping her grounded and focused during that time in her career! After retiring, she joined the staff at Ecological Laboratories, Inc. where—given a computer and a phone, installed as Customer Service Representative, trained in the amazing biological technology of Microbe-Lift®—Carolyn just let loose! And, because of her contributions over the years to *Water Gardening*, *MacArthur Water Gardens* and *Pond & Garden* publications, and because she had already been answering pond and koi questions for a number of years, Ecological sought after her as the perfect fit!

In '96, Carolyn joined the Mid-Atlantic Koi Club. In '98, after the initial outbreak of KHV on the east coast, she attended her first koi health seminar instructed by Dr. Myron Kebus at Kellenberg High School on Long Island, NY. Before moving to Florida, Carolyn held the VP position in MAKC local chapters from 1999-2006 and chaired two koi shows. She spent many hours tagging along with the Suburban Water Garden crews as they installed streams, ponds and fantastic water features on Long Island. She assisted with water quality at the Brooklyn Botanic Garden when the renovation of the Japanese Garden & Pond was completed and she documented the public ceremony, dedicating the grand opening and restocking it with new Japanese koi.

Today, Carolyn is an active member of the NRA, the Cape Coral Friends of Wildlife (CCFW) and National Association of Pond Professionals (NAPP). She's attended the Holland Koi Show and numerous Koi Health Seminars at UGA. She is editor of *The Microbe-Lift Watergardener* as well as an avid and passionate photographer, whose beautiful vision is featured within these pages. She is also a frequent contributing author and editor for MAKC magazine and is generous with her articles to other koi and water gardens, when requested.

Carolyn is proud of her new Florida home, beautifully landscaped with a formal 4,000 gallon koi pond with all the bells and whistles... and a mortgage to match! Her first koi cost \$30 in 1990 and the last cost \$2,000 in 2007... and she still hasn't found the "perfect" one yet! Carolyn is *koi kichi* and wants the best water for her fish.

Photographs

from the **SARASOTA POND TOUR** of 5/9/09
by **CAROLYN WEISE**



*"I not only truly enjoy the CONTENT of these pages,
but also the masterful photographs.
I'm amazed at the DETAILED reflections
captured in the waters & APPLAUD all the beauty
brought to us in everyday subject matter
that we might ordinarily miss! BRAVO!"* — ANDREA B.



*“I can’t say enough
GOOD THINGS,
about your business.”*
— MARY

VALUE PACK!
MICROBE-LIFT

PONDLESS WATERFALL KIT

MICROBE-LIFT®/PL & MICROBE-LIFT®/OXY POND CLEANER will safely & effectively break down unsightly debris, prevent odor & deep clean rocks in your pondless waterfall!

Item # PWK
Case Pack: 6

MICROBE-LIFT®/PL is the #1 selling bacterial additive on the market! It will create a cleaner environment for your pondless waterfall by dissolving away organic sludge. It seeds and maintains biological filters and significantly reduces hydrogen sulfide and other strong, offensive, noxious odors by breaking down dead algae and reducing the buildup of bird droppings, dead leaves and fish feed, improving dissolved oxygen levels and reducing biological oxygen demand (B.O.D.).

MICROBE-LIFT®/PL is effective over a wide range of pH conditions and contains photosynthetic bacteria which reduces cloudy water by promoting flocculation and settling of organic and inorganic particles.

MICROBE-LIFT®/OPC OXY POND CLEANER uses Oxygen Power to safely break down all areas of unsightly, light-to-heavy debris accumulation on rocks, waterfalls and streams, and deep cleans rocks and planters. Especially helpful on waterfalls, it oxidizes and detoxifies, helping to prevent pond odors. **MICROBE-LIFT®/OPC OXY POND CLEANER** is 100% safe when used as directed.

MICROBE-LIFT®/OPC OXY POND CLEANER works best in warmer weather. To achieve the best results, shut down waterfalls and clean out as much accumulated debris as possible. Treatment is as simple as sprinkling over areas with debris build-up! To maintain a continued proper ecosystem in your pondless waterfall, always add **MICROBE-LIFT®/PL**, or any bacterial/enzymatic treatment. 48 hours after using **ML®/OPC OXY POND CLEANER**.



MICROBE-LIFT®/PONDLESS WATERFALL KIT is easy to use:

1. Apply MICROBE-LIFT®/PL as directed on the ML/PL box for the first four weeks.
2. After the first four weeks, continue adding ML/PL at the Maintenance Dosage once or twice per month to maintain water clarity, eliminate odors and reduce bottom solids accumulation.
3. Apply MICROBE-LIFT®/OXY POND CLEANER as indicated on label, to break down any organic accumulation that builds up on rocks or other surfaces in the pondless waterfall. ML/OXY POND CLEANER will also assist ML/PL in the breakdown of accumulated bottom solids.

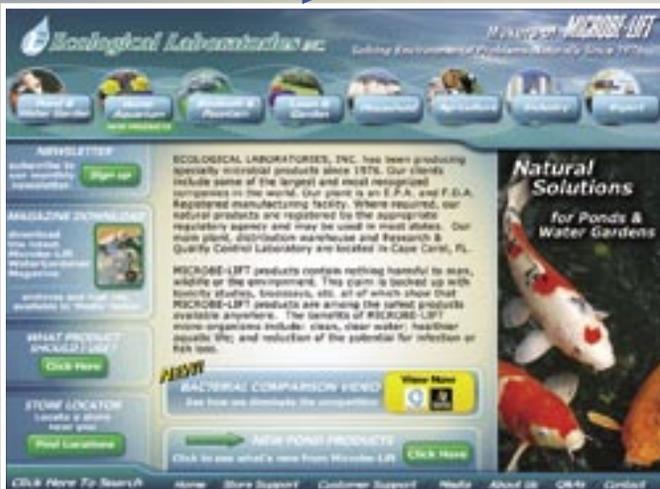
MICROBE-LIFT
PONDLESS WATERFALL KIT

Safely & effectively breaks down unsightly debris, prevents odor & deep cleans rocks in your Pondless Waterfall with **MICROBE-LIFT®/OXY POND CLEANER** & **MICROBE-LIFT®/PL**—the #1 selling pond bacterial additive on the market!

Repeat treatment as regular maintenance.

Navigating the

MICROBE-LIFT® WEBSITE



WE HAVE A BEAUTIFUL WEBSITE! It is literally *loaded* with information... practically anything you could want or need to know! The site includes: the history of Ecological Laboratories, Inc; the entire family of **MICROBE-LIFT®** products and how to use them; information about those serving you and representatives in the field; videos; web posts; and so much more! Visit www.microbelift.com and browse to your heart's content. The site is well-updated and maintained to keep you consistently informed and continually intrigued...and a good lot of the site I wrote myself!

Visiting the **HOME PAGE**

Pond & Water Garden, Home Aquarium, Birdbath & Fountain, Lawn & Garden, Household, Agriculture, Industry or **Export**

- Click on any of the 8 categories (*across top*) to explore these areas and learn about products specific to them.

New Bacterial Comparison Video

- See how we *dominate* the competition by clicking (*lower center*) to view and hear **Mark Krupka, Ecological Laboratories' VP & Technical Director**, review the characteristics of MICROBE-LIFT®/PL versus several competitor's products.

New Pond Products

- If you'd like to know what's new, click here (*found top & bottom center*).

What Product Should I Use

- Clicking here (*also accessible under Customer Support*) will take you to our invaluable **Product Usage Guide**.

Store Locator

- **Customers:** Click on **STORE LOCATOR** to search for a store up to 200 miles from your zip code that carries **MICROBE-LIFT®** Pond, Aquarium or Septic products in the USA.

- **Stores:** Likewise, click on **STORE LOCATOR** and register for **free** under the **DEALER SIGN UP** to inform consumers which **MICROBE-LIFT®** products you carry.

continued



Exploring the **BOTTOM BAR**

Customer Support

At the bottom of our Home Page is the **CUSTOMER SUPPORT** tab which will bring you to a page where you can access endless amounts of helpful information. I'll go through just a few of those areas here, but please take the time to enjoy browsing through yourself.

- Click on **MICROBE-LIFT® FAQs** to learn everything you'll need to know about caring for your pond.
- If you still have the energy, click on **PONDKEEPING 101** to read articles contributed by veteran koi keeper and pond builder Tom Burton, which will help newbies in this hobby.
- If you don't know how many gallons are in your rectangular pond, **TOOLS** will bring up the **POND CALCULATOR**. Remember to use the average depth (in feet) to get your pond volume.
- **ASK THE EXPERTS** is a great way to have any of your questions answered!

Media

• Next, go to the **MEDIA** section. There you can view and/or download any **MICROBE-LIFT® Watergardener Magazine** as well as my monthly newsletters. You can also click on various **DVDS** to watch video of **Mark Krupka, Ecological Laboratories' VP & Technical Director**, as he reviews our extensive family of pond products.

Q&As

• Hobbyist and retailer Q&A's and my replies are posted here in the **FORUM** section.

Store Support

• Would you like to send us *your* info? Then click on **STORE SUPPORT** and up pops an area that will let you! Or, access tabs that bring you to our **CATALOGS**, **MSDS (Material Safety Data Sheets)**, listings of our **TRADE SHOWS** or **SALES REPS**, and a whole lot more.

Click Here to Search

• On our site, nothing is "hidden". Everything is placed where you are most likely to find it easily when searching. However, should you be looking for a specific product and don't know where to go, click here (*at the bottom left*) and a window will pop up where you can input your search.

I hope you just have **fun** exploring the wealth of information found on our exciting site! 🌱

“Whoever is in charge of your website has done an excellent job. It's very USER FRIENDLY & I need all the friendly I can get! I was able to find exactly what I needed to know. The illustrations & photos are great. Thanks for making it SIMPLE.”

— JACKIE NANTZ, N.C.



MICROBE-LIFT®

A well-balanced Koi diet,
NATURALLY!



LEGACY



MICROBE-LIFT®/LEGACY™ is not just a fish food...
it's a complete nutritional feeding system! Contains
bacteria that produce enzymes which help break down
proteins, lipids & carbohydrates.



Contains
**Nature's
Building
Blocks**

**A SOURCE OF LIVE (VIABLE),
NATURALLY OCCURRING MICROORGANISMS**
That are FDA and EU approved



MICROBE-LIFT
Watergardener

View Our New Water Gardening Magazine Online
Located in Our Media Section or on Our Home Page

**Ecological
Laboratories INC.**

Providing Aquatic Solutions Since 1976



www.MicrobeLift.com

SPRING SUMMER ARCHIVAL RESOURCES

www.microbelift.com/htmls/video.php

SEASONAL ISSUES

- OPENING THE POND – JUMP START YOUR FILTER by *Carolyn Weise* – SPRING/SUMMER 2006
SPRING STARTUP IN A KOI POND by *Dan Phillips* – SPRING/SUMMER 2008
WAKE-UP CALL! by *Bob Passovoy* – SPRING/SUMMER 2008

WATER QUALITY ISSUES

- OPENING THE POND – JUMP START YOUR FILTER by *Carolyn Weise* – SPRING/SUMMER 2006
WHISPER DOWN THE “TECHNICAL ALLEY” by *Mark Krupka* – SPRING/SUMMER 2006
TESTING YOUR POND’S WATER by *Mark Krupka* – SPRING/SUMMER 2007
PLANT FORUM – POND WEEDS (ALGAE) by *Rowena Burns* – SPRING/SUMMER 2007
WATER CHANGES – WHY, HOW & HOW OFTEN by *Mark Krupka* – SPRING/SUMMER 2008

POND CONSTRUCTION / FISH HEALTH ISSUES

- PROTEIN & PROTEIN QUALITY IN FISH FEEDS by *Carl D. Webster* – SPRING/SUMMER 2006
CATCHING FISH by *Tom Burton* – SPRING/SUMMER 2006
BUYING NEW KOI – THE URGENCY OF QUARANTINE – SPRING/SUMMER 2006
A WATER GARDEN & WHAT IT TAKES TO MAKE ONE by *Tom Burton* – SPRING/SUMMER 2007
KHA CORNER – ARE YOUR KOI HEALTHY? by *Dan Phillips* – SPRING/SUMMER 2007
COME ON IN! THE WATER’S FINE by *Betsy Kravitz* – SPRING/SUMMER 2007
GOLDFISH IN PONDS by *Peter Ponzio* – SPRING/SUMMER 2007
A BETTER PRE-FILTER – SPRING/SUMMER 2008
ARE YOU EATING WELL? by *Carolyn Weise* – SPRING/SUMMER 2008
HEALTHY FISH, THE HERBAL WAY – SPRING/SUMMER 2008
GOLDFISH KEEPING by *Peter Ponzio* – SPRING/SUMMER 2008
PLANT FORUM – TOXIC GARDENS by *Carolyn Weise* – SPRING/SUMMER 2008

ADDITIONAL INTEREST ISSUES

- Q&A’s – BEGINNERS WANT TO KNOW – SPRING/SUMMER 2006
PLANT FORUM – QUEENS OF THE POND (LILIES) by *Greg Speichert* – SPRING/SUMMER 2006
ALRIGHT, WHY SHOULD I GO TO A KOI SHOW? by *Bob Passovoy* – SPRING/SUMMER 2006
DO YOU HAVE AN AQUARIUM? by *Carolyn Weise* – SPRING/SUMMER 2007
MICROBE-LIFT IN OTHER LANDS by *Carolyn Weise* – SPRING/SUMMER 2007
ML DEALER INTERVIEW with *Bob Gogan STONERWORKS PONDS* – SPRING/SUMMER 2007
ML DEALER INTERVIEW with *Eddie Brock Jr. BROCK FARMS* – SPRING/SUMMER 2008

PHOTO by CAROLYN WEISE / RETOUCHING BY ANDREA ROSS BOYLE



To receive your **exciting monthly e-newsletter** filled with educational articles by prominent authors in the water gardening field, simply email info@microbelift.com or just simply go to www.microbelift.com and submit your email address on the home page. In addition, you can download or request by mail **one-time discounted product coupons**, redeemable at any participating **MICROBE-LIFT** dealer in your area as our thank-you, from Ecological Laboratories, Inc!

Not offered to persons under age of 21. NOTE: Personal information not to be sold or exchanged. Your privacy is our guarantee.