FALL/WINTER 2006

the MICROBE-LIFT® watergardener

KOI FARM FALL HARVEST
Pulling the Pond

SECRETS OF CLEAR WATER

Q&A's
Beginners Want to Know

PHOTO CONTEST & UPCOMING EVENTS

Overwintering Waterlilies

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Why are MICROBE-LIFT®

pond'toons

better than common aquatic planters?

- Potted aquatic plants root in soil or pebbles. Soil can wreak havoc in a koi pond from an upturned pot. Pots can also impede water circulation and distribution of nutrients to the root zones. NOT with POND'TOONS™! POND'TOONS™ allow plant roots direct exposure to the water where they soak up nitrates and phosphates, and flower continuously.
- Pots on the pond bottom or plant ledges interfere with water circulation and allow "dead zones" to form where fish waste can accumulate. It makes proper cleaning impossible. NOT with POND'TOONS™! POND'TOONS™ do not prevent pond water circulation, therefore your filter system works more efficiently!
- Koi love to poke around in potted plant soil looking for aquatic crustaceans and other invertebrates and can really create a mess. NOT with POND'TOONS™! POND'TOONS™ completely protect your colorful garden plants from the pond fish. Additionally, there is a haven for baby fish, water clarifying rotifers, and other important lower life forms within the special layers.
- POND'TOONS™ offer welcome shade and predator protection to pond inhabitants.

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4 LAYERED ZONES

Naturalistic appearance blends well with shale pond edging.

rocklike foam float

open weave middle zone

Furnishes koi with a safe space place for spawning, catching and harboring fertilized eggs and protects hatched fry

tight weave bottom zone

Harbors micro-organisms that are found naturally in the shallow, oxygen-rich waters of wetlands, purifying the water.

Plant plugs fit into the center of POND'TOONS™, where roots grow down into the water and absorb nitrates.

protective mesh

Keeps hungry adult koi from getting to the plant roots.

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featured in this issue

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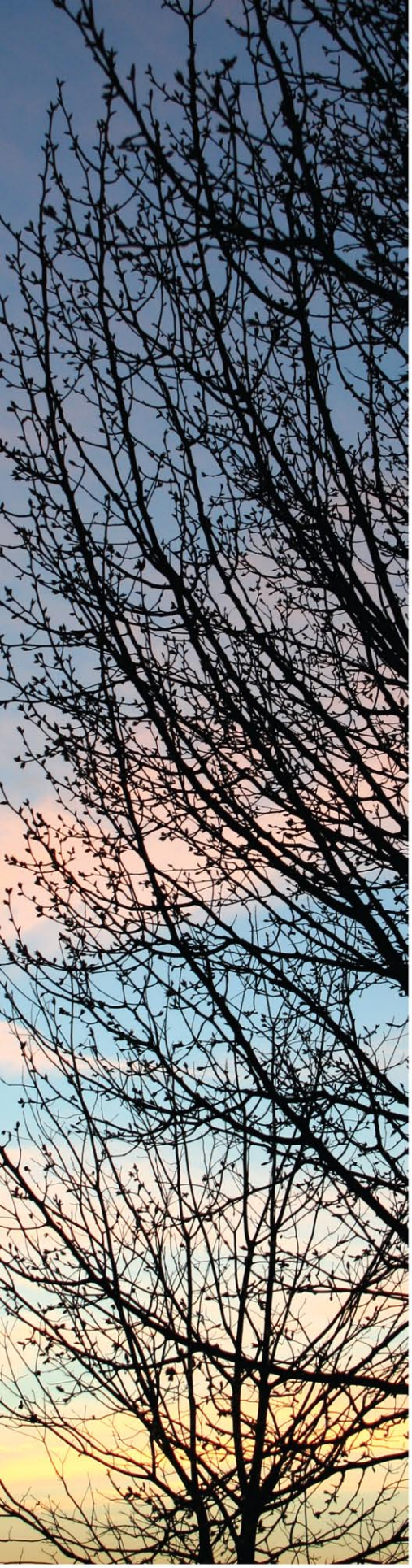

PHOTOGRAPH BY CAROLYN WEISE

editor's letter

about the editor

Carolyn is the Consumer Relationship Manager of Ecological Laboratories, Inc. and liaison to koi and water garden clubs in the USA 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 three times been awarded "Koi Person of the Year". She is a regular columnist for "Water Gardening Magazine" and the former "Pond & Garden Magazine", writes a weekly Q&A column for "MacArthur Water Gardens", Boca Raton, FL, and writes freelance for Ponds Magazine. In her spare time, she maintains her own koi pond and active participation in Mid-Atlantic Koi Club on Long Island, NY.

WELCOME BACK! Hope you enjoyed our Spring/Summer issue. Ecological Laboratories, Inc. and I have been very busy collecting pictures and articles for your pleasure. As fall is near, with winter right behind, a pond owner has no time to rest. In this issue, you will find articles to make closing the pond easier and ideas for next year right at hand. This is the time to reflect: was this season all you hoped? Did your pond work for you? Are your fish happy in the pond or did you have problems in facing new challenges? Are you ready to improve, expand or replace your existing pond? Is there something you need to know?

It is an annual event for me to cull fish from my pond. My koi are robust, very healthy and spawn prolifically. So far I've been able to place all the extras in new homes. In the past, some of these homes have not proven winter-safe, but the people have improved their ponds to make it better. Then they returned for more fish next spring. The time will come where I need to consider alternatives, when my resources are exhausted, but for now, we are all happy. I know not to put fish into local ponds or waterways where they are not native species (and koi are not native to North America). I believe in being a responsible hobbyist. I hope you will be too. We want our hobby to continue to grow and prosper.

Have you been to a koi show lately? I have been attending koi shows across the country, sitting in on lectures, gathering information to share with you. It was my good fortune to be at the Koi Lab in Athens, GA, in February 2006 for a weekend of koi health training. The bottom line in pond and koi care is proper pond construction and careful maintenance. Then, add the best nutrition (be it for fish or plants) and your pond will give back tenfold what you have put into it. Now, as we do our fall clean-up and maintenance chores, we can do so with next year's success in mind…

Your editor,

Carolyn Weise

P.S. I would like to draw your attention to the amazing neighborhood projects and water quality articles in this edition. The National Association of Pond Professionals is always creating something out of nothing, in a way that looks like it was always there. Since Lady Bird Johnson turned her beautification energies on the world, we all have realized a better place in which to live. We are enjoying more quality life, reducing stress and striving for the Eden which once was and can be again. Use our website **www.microbelift.com** for answers to all your pond questions. MICROBE-LIFT products are a big part of this picture and making the dream a reality…

this issue's *featured* AUTHORS

MARK KRUPKA
Vice President and Technical Director of Int'l. Sales, Ecological Laboratories, Inc.

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.

Mark has published numerous articles and technical papers on environmental microbiology, aquatic ecosystems, pond ecosystems, biological wastewater treatment processes, strain selection, bioaugmentation and bioremediation. Mark serves on the board of directors of the NAPP.

GREG SPEICHERT
Horticulturist,Publisher and Editor of Water Gardening magazine and Midwest Gardening magazine

Greg is an accomplished horticulturist and an avid plant breeder. He is a favorite speaker for plant societies, landscape organizations, and garden clubs. He is the author of three books on water gardening: The Encyclopedia of Water Garden Plants, Water Gardening in Containers (co-author), and Ortho's All About Water Gardening. Greg is the Publisher of Water Gardening magazine and Midwest Gardening magazine. Greg's articles have appeared in Fine Gardening, American Nurseryman, and Pondkeeper, as well.

BOB PASSOVOY
President Mid-West Pond & Koi Society

Bob Passovoy stumbled innocently into ponding eleven years ago when his wife decided she wanted a water lily. He now operates a 4400 gallon koi pond with 28 koi, a 550 gallon swamp with fancy goldfish, a filtration system that'll give you nightmares, and (because he left the room at the wrong time) is president of the largest water gardening club in the Midwest, namely the Midwest Pond and Koi Society, Illinois. Bob is a part-time dental surgeon and full-time water gardening family man, and a highly-respected member of the community. When not setting up shows, he is writing for club magazines and sharing his knowledge with newcomers.

BOB RIESER
President - The Frog Bog Verona, WI

Bob has studied ponds for 28 years and taught pond construction at technical colleges, botanical gardens, intermediate, middle and high schools, garden and pond clubs, and the University of Wisconsin Extension. He began building ponds over 15 years ago and began THE FROG BOG (retail and wholesale) pond supply store in 2000. Bob continues to act as consultant to landscapers and individuals on pond care, maintenance and pond construction.

TOM BURTON
Veteran Mid-Atlantic Koi Club Member

Tom Burton has been active on the Mid-Atlantic Koi Club Advisory Board, was'92 Koi Person of the Year, Northern Chapter VP for many years, and following training at the University of Georgia's fish-vet course, founded MAKC's Health Hot Line, now featured in the Mid-Atlantic Koi magazine. A frequent speaker on the subject of pond building, and a sought out pond building consultant, he has been well received at the International Water Lily Symposium, Longwood Gardens, the New York Botanical Gardens and Hofstra University as well as a guest speaker at Canadian events. He is the second most published author in the well-received book From the Pages of MAKC News and is renowned for his design and building of one of the most admired ponds and gardens in the country.

MAX HAMMOND
VP Production Nature's Expressions, Inc. Nicholasville, KY. NAPP President

Max Hammond is Vice President of Production at Nature's Expressions, Inc. in Nicholasville, Kentucky. Nature's Expression is a design, build, and consulting firm focused on outdoor life and water features. Max also serves as the President of the National Association of Pond Professionals (NAPP), a non-profit organization whose purpose is to develop standards and education for the water gardening industry. NAPP is the only membership operated non-profit organization who serves the water garden industry for the purpose of educating contractors, retailer, and manufactures alike.

VICTORIA BURNLEY-VAUGHAN
Director of Aquatic Services College of Veterinary Medicine, University of Georgia

Victoria Burnley-Vaughan is President of Molecular Therapeutics, the manufacturers of Tricide-Neo; is a partner in Koi Affiliates, LLC, producer of high quality certified KHV-free domestic koi. She is Co-Director of Specific Pathogen-free Aquaculture facility, Coordinator of Fish Health Maintenance Course, College of Veterinary Medicine, Coordinator of Koi Herpes Virus research at Veterinary School, UGA, and Director of Koi Lab Diagnostics.

DAVID DUENSING
President -David Duensing & Associates. Inc, NAPP Director

Dave Duensing of David B. Duensing & Associates, Inc. began designing water features in the 1970s while working with stone to create natural settings. This led to the formation in 1989 of David B. Duensing & Co., one of the nation's first firms to specialize in waterfall and water garden design, construction and troubleshooting.

By the mid 1990s, Duensing became active in many aspects of the industry, including pond filtration product design and manufacturing. His knowledge of design, construction and maintenance – together with his close affiliation with Anthony Archer-Wills - brings clients a breadth and depth of knowledge unequal among water feature designers.

Dave Duensing served as the first President of The National Association of Pond Professionals. He contributes extensively to the association's original educational curriculum and certification program, and continues to lead more than 60 seminars annually for members of the water garden, swimming pool and irrigation industry.

MYRON J. KEBUS, M.S., DVM
Veterinarian

Dr. Myron J. Kebus is a licensed veterinarian with a practice specializing in ornamental and commercial fish. He can be reached at Wisconsin Aquatic Veterinary Services in Madison.

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NAPP
National Association of Pond Professionals

VISIT THE NAPP "National Association of Pond Professionals" website at: www.nationalpondpro.com

Questions & Answers

Beginners ask

by Carolyn Weise of Ecological Laboratories, Inc.

Q I AM A FIRST TIME USER OF AUTUMN WINTER PREP. I NEED MORE DIRECTIONS, WHERE IS THE BEST PLACE TO POUR IN TO POND - PUMP AREA? BIOFALLS AREA? POND?
IF AN INSTRUCTION SHEET WAS TO BE IN THE BOX I DID NOT GET ONE. COULD YOU EMAIL ME BETTER INSTRUCTIONS? I LIVE IN W.I. SO I AM SURE IT IS TIME I BEGIN USING THIS PRODUCT NOW. MY POND IS 2500 GALLONS.

A You are going to love this product! The liquid can be started anytime, but the cellulase enzyme packet shouldn't be used until a week or two after the leaves in your area have started to fall. The AWP continues to provide sustained biological activity even in water temperatures down to 40°F.
The water soluble cellulase packets are made to remove any leaf matter, sludge, and other organic sediment through the winter. When putting these into the pond, the best place would depend on the type of system you have. You want it to stay as long as possible in the pond itself, so the best place might be the farthest from the filter or skimmer. Or if there is a specific place that leaves are likely to gather, that might be the low point in the bottom, drop it in there. The water should distribute it around as the bacteria proliferate in the pond. But why not give it a good place to start?

Q WE ARE USING YOUR BIO-LIFT FOR OUR SMALL GARDEN POND AND ARE VERY HAPPY WITH THE RESULTS. HOWEVER SINCE THIS IS OUR FIRST YEAR TO USE IT WE DON'T HAVE A CLUE ON WHEN TO STOP USING IT IN THE WINTER TIME. COULD YOU PLEASE TELL US WHAT THE TEMPERATURE SHOULD BE TO STOP PUTTING IT IN?

A MICROBE-LIFT/PL is a great product! It is for use anytime when the pond water is not as clear as you want it and the temperature is over 45°F (8°C). ML/PL continues to balance the pond's ecosystem down to that temperature, and will remain dormant becoming viable again when the temperature once again reaches 45°F in the spring. However it is a good idea to refresh the supply in the spring due to freezes that could deplete the supply of available bacteria during winter months.
Have you used the MICROBE-LIFT/Autumn Winter Prep to prepare the pond for the colder temperatures and remove any organic leaf matter throughout the winter months that might settle to the bottom of the pond?

Q I LIVE IN IOWA. IT IS ABOUT 55-65 DEGREES RIGHT NOW. SHOULD I JUST FEED THE FISH THE COLD WEATHER FOOD EVERYDAY OR SHOULD I MIX IT WITH SOMETHING.

A With the temperatures going down, you will need to monitor the water temperature rather than the air. Depending upon the depth and site of the pond, the water will cool at a different rate than the air as a rule.
It would be a good idea to use only the cold weather food at this time to be on the safe side. When the water temperatures dip below 50°F, the fish probably won't be feeding anymore. If your base temperature is 55° now, you should be feeding only cold weather food and once a day. Smaller meals of a nutritious wheat germ food are the best way to prepare your fish for their fast.
The reason for slowing down on feeding is that the fish have no stomach with which to digest their foods. Unlike humans and other mammals, they have "one long intestine" in which all the digestive processes take place. It takes four days from the mouth to the tail for a fish to process and eliminate, extracting all nutrients available. That would be in 75°F water.
These fish have no way to produce heat for themselves and are completely dependent upon their environment. Therefore, as the water temperature drops, so does their inner temperature and metabolism. By the time it reaches 50°F, the basic digestive function is minimal. At that time, any food which remains undigested is still in the system and might begin to putrefy if the fish can no longer eliminate it. And we all know, today, how bad acid reflux disease feels, don't we?
Yet, it kills fish over the winter. They need a full four days of temperatures over 50°F to eliminate the "last supper" – or, according to the fish experts, they die.
The cold weather wheat germ, vegetable-based protein foods are simply easier for them to digest and eliminate at a time when we do not know how the weather will behave. It is also an important food for easy absorption of nutrients. Yes, it's a good – no, a very good idea to just feed cold weather food now!

Q I HAVE A LOT OF OAK TREES IN MY YARD AND CONSEQUENTLY I HAVE A PROBLEM WITH LEAVES IN POND DURING FALL AND WINTER. I HAVE INSTALLED FISH NET ON A TRIPOD TO KEEP OUT THE LEAVES, BUT SOME STILL GET IN, CAUSING THE WATER TO BE DARK TEA COLOR. LAST YEAR I USED SLUDGE AWAY FOR SOME SLUDGE BUT STILL HAD THE COLOR PROBLEM.
I LIVE IN VA, ZONE 6 AND THE POND IS APPROXIMATELY 2500-GALLONS. WHAT SHOULD I BE USING? DO I NEED A COMBINATION OF SEVERAL PRODUCTS?

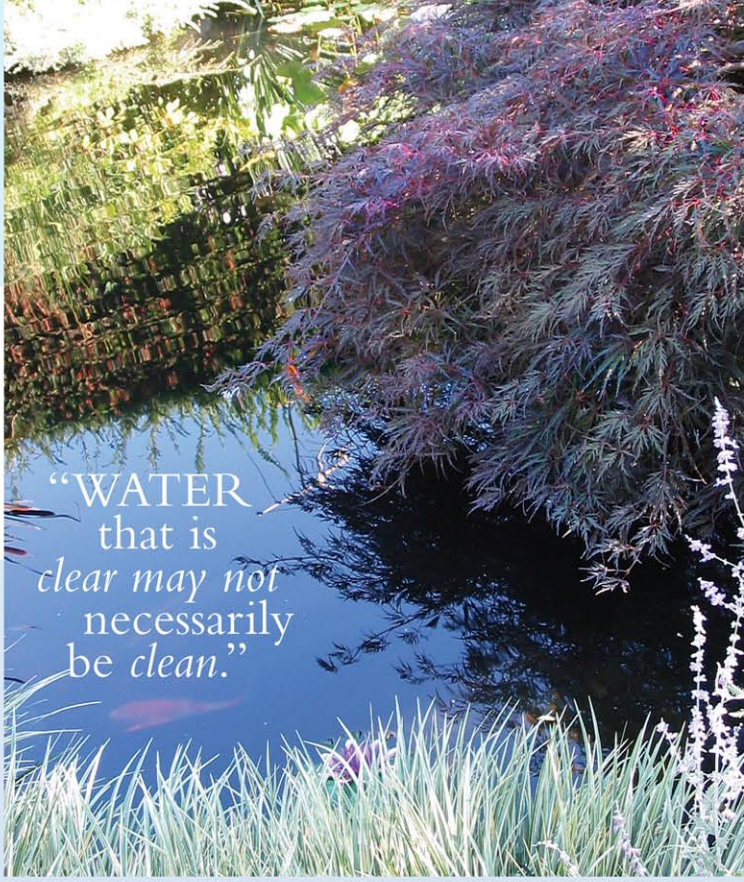
A You should use the MICROBE-LIFT/Sludge Away for any collected debris or sediment on the bottom of the pond that doesn't biodegrade easily with the ML/PL alone. However, leaves and water present real challenges in keeping a pond clean. Short of sealing up the pond in plastic, it is practically impossible to prevent SOME leaves from entering. Oak leaves are especially slow to break down leaving us with a long-term emission of tannic acid.
You are not alone. MICROBE-LIFT has pre-colonized Super-Activated Carbon Pellets and Master Media Bags for convenient management of dye and toxin removal from the water. Water changes will help and you would need to remove any visible leaves as they fall into the pond. But carbon is the way to clear up the "tea colored" water.

PHOTOGRAPH BY CAROLYN WEISE

It's not rocket science to have clean and clear pond water, and having good water is a lot easier than performing brain surgery on your koi and goldfish

Secrets of CLEARWATER

By Myron J. Kebus, M.S., DVM



PHOTOGRAPHS BY CAROLYN WEISE

I know a few pond owners who are able to have large, luxurious koi and goldfish in their water gardens, even though they have almost no understanding of what goes into good water quality and proper pond filtration.

Those few pond owners are the exception, and not the rule. For most pond owners, keeping koi and goldfish requires an understanding of water quality and filtration. The subjects are not hard. The real problem, I suspect, is that they're not glamorous. They are, however, critical to proper care of our koi and goldfish.

Designing a filtration system adequate for a koi pond is far beyond the scope of this issue. It is possible, though, to define and explain the basic concepts of good water quality and proper pond filtration.

GOOD WATER QUALITY

Regardless of the type and extent of filtration there is in any pond, none of it makes any difference if it doesn't work properly. To keep koi and goldfish, we must have good water. Good water is water that is clear and clean.

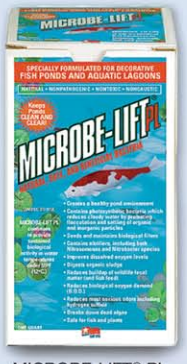
The water in our ponds must be clear – in the sense that you can see through it, ideally all the way to the bottom of the pond. The water in our ponds must also be clean – in the sense that it is free of chemicals that are harmful to our pond fish.

Water that is clear may not necessarily be clean. Certain chemicals have no color to them, yet are very damaging to fish. Ammonia is one that comes immediately to mind. So to have healthy fish, we must have clean and clear pond water. To this end, we must have good mechanical and biological filtration.

MECHANICAL FILTRATION

Mechanical controls on pond water are those that physically clean the water by removing particles and debris. Filter pads, brushes and nets all trap debris that floats through the water, straining away the particles so that water is clear. Settling tanks trap debris and cause it to fall to the bottom of the tank, where it can be removed by means of a bottom drain. Ultraviolet sterilizers use radiation to kill algae and other living organisms, so they can be trapped by mechanical filters that remove them from the pond water.

Regardless of whether you have one fish or 100, you will certainly need mechanical filtering that traps debris so that it doesn't cloud the pond water. Biological filters don't work properly if they are clogged by dirt and debris. Particles in pond water are prime breeding ground for bacteria and other organisms that can harm koi and goldfish. And what reason is there to have koi and goldfish if you can't see them because the water is dirty?



MICROBE-LIFT® PL

BIOLOGICAL FILTRATION

While mechanical filters remove debris from the water, biological filters remove harmful chemicals and keep the pond water clean. Biological filtration is accomplished mainly by beneficial bacteria. Although the process is complicated, it is best understood when considered in the context of the nitrogen cycle.

To work properly, biological filtration requires adequate aeration and good water movement. Beneficial bacteria are primarily stationary creatures, and so the water must move past them for them to do their job. Oxygen is also necessary for them to work correctly, and so you must have well-aerated water for the beneficial bacteria to survive and grow. Beneficial bacteria also need to stay clean. They can't do their job well if they are coated with dead algae and fish waste. And while it may be true that some bacteria are capable of breaking down solid waste, there's no reason to let solids accumulate in your pond. Besides, are you running a sewage plant, or keeping a pond?

NITROGEN CYCLE

The nitrogen cycle is the process by which ammonia is converted to less harmful, and ultimately harmless, components. The conversion of ammonia to less harmful chemicals is the work of certain kinds of bacteria that live in wet environments. Nitrosomas bacteria consume the ammonia and convert it to nitrites. Nitrites are harmful to fish although not so much as ammonia. Meanwhile, nitrobacter bacteria convert the nitrites to nitrates. Nitrates are used by plants as fertilizer. Some aquatic plants, such as cattails, rushes, pickerel plants and many submerged water plants are particularly good at using these nitrates as food for growth.

Beneficial bacteria require oxygen in order to grow and multiply. Biological filters are placed so that water runs through them, thereby oxygenating the bacteria. They will colonize many different kinds of surfaces, especially ones with plenty of 'nooks and crannies.' Pond owners select filter media based on the amount of surface area it will provide to promote the growth of beneficial bacteria.

Originally printed in Water Gardening magazine, Volume 10, Issue 3.

Koi Farm Fall Harvest - Pulling the Pond

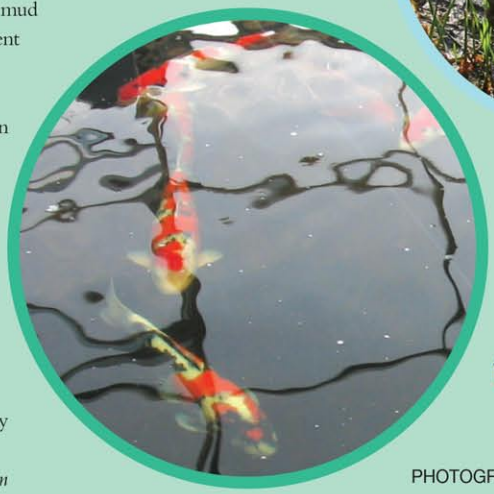
by Carolyn Weise of Ecological Laboratories, Inc.

GUESS WHO went to a pond pull (koi harvest) at Quality Koi Company/Nisei Koi Farm? The fall of 2005 was the first time I had seen this in person and it has added a whole new dimension from looking at pictures to actually being there. It was an honor to be invited and a thrill to be able to go! At first I thought I was going to be going into the ponds with the men and catching fish, silly me! But it's nothing like that. Imagine a crowd of 30 people milling around trying to catch fish that are worth more than you or me! I can't imagine taking pictures of a scene like that. I am a strong believer in naivety and welcome reality with childlike wonder. I hope I never lose the magic of life.

The first day was taken up with the long drive from New York to South Jersey, and then standing around in cold, stormy weather while we watched the pros carry out their fall duties, bringing in the fat harvest. People were chatting, laughing, excited as each koi emerged, taking photos, trying to identify whose was whose fish. Many of the fish harvested that weekend were bought the previous year and left at the farm to grow in mud ponds over the summer. It was very exciting! On top of all the excitement we were lectured on the merits of each fish, so much was learned.

That evening some of us went to a restaurant, celebrating the 2nd annual harvest for the Quality Koi/Nisei Koi Farm. Yours truly was again blessed to be part of the celebration.

Considering the nasty weather Saturday, I dressed warmly, as did the rest of the returning crowd, but Sunday brought sunny, spring-like weather, and jackets and sweaters were cast off on the ground around us. The weather was perfect for the rest of the harvest and the auction. I even bid on a couple of fish, but when the price went out of my range, I had to let it go. That is sad because for the price of the fish they would also keep the fish through the winter, indoors, and put them in the mud ponds next summer! So, what we were bidding on was a GREAT DEAL, and I just didn't have enough money. Story of my life… I had a wonderful experience nonetheless and will go back for another try this year… *Go to www.qualitykoi.com*



"It was an HONOR to be *invited*…"

PHOTOGRAPHS BY CAROLYN WEISE

A Word About Vitamin-C

by Phil Kemp

Vitamins are not nutrients, but are dietary essentials required in small amounts by all forms of plant and animal life. They are catalytic in nature and function as part of an enzyme system.

Vitamins are broadly classified as fat soluble and water soluble. Vitamin-C is water soluble. This is one of the reasons extra attention is given to Vitamin-C in aquatic diets. Vitamin-C in fish feeds are degraded primarily during the manufacturing process by heat and moisture. Studies have shown that Vitamin-C (ascorbic acid) levels are severely compromised after processing and additional degradation occurs with prolonged storage.

Knowing that Vitamin-C is essential in aquatic diets (essentially a critical need for development of bones, scales and fins during growth stages), how can we manufacture extruded and pelletized feeds and still maintain Vitamin-C levels in the finished products for extended periods of time? Well, a product was developed to take care of this big problem. The solution was Stabilized Vitamin-C.

This product is a spray dried powder consisting of a stabilized (phosphorylated) Na/Ca salt of L – ascorbic acid. Esterification of ascorbic acid at position 2 protects Vitamin-C from destruction by oxidation. It contains primarily the monophosphate ester of L-ascorbic acid, with very small quantities of diphosphate ester and traces of triphosphate ester. The molar activity of the phosphorylated esters of Vitamin-C is equivalent to L-ascorbic acid.

Wow... What does that mean to you and me? Well, they did it! Tests have determined the degradation of Vitamin-C over time is now less than 1% per month. The percent of Vitamin-C lost during the extrusion process was also dramatically reduced. We formulate the feeds to include enough Vitamin-C to compensate for these planned losses. Concerns about Vitamin-C levels in high quality fish feeds, such as MICROBE-LIFT/Legacy Koi & Goldfish Foods are a thing of the past.

Vitamin-C is most critical when fish are growing, for development of scales, bones and fins. Too much Vitamin-C is harmless, but too little can result in the following diseases: Scoliosis; lordosis; abnormal opercles; impaired formation of collagen; impaired wound healing; abnormal cartilage; twisted, spiraled, deformed cartilage of gill filaments; clubbed gills, hyperplasia of jaw and muscle; deformed vertebrae; eye lesions; hemorrhagic skin, liver, kidney, intestine and muscle; retarded growth; loss of appetite; increased mortality; eventual anemia.

OVERWINTERING Waterlilies

by Greg Speichert of Water Gardening Magazine
www.watergardening.com P.O. Box 607, St. John, IN 46373

Waterlilies can be split into two groups: hardy and tropical. If you don't know what kind you have, look at the edges of the leaves. If the edges are smooth, they are hardy. If they are serrated, you have tropical waterlilies. And just like the leaves, different methods of care are unique to the two groups of waterlilies.

TROPICAL WATERLILY

In warmer climates, tropical waterlilies can stay in the pond throughout the winter. They can tolerate water temperatures down to 60°F. Farther north where frost is an issue, tropical waterlilies will have to be brought indoors. Some cultivars, like Nymphaea 'Dauben' and N. 'Panama Pacific,' that are prone to viviparous growth are not likely to form dormant tubers and must be overwintered using the aquarium method. Other selections may be dried down and stored as dormant tubers.

THE AQUARIUM METHOD

Take the plant out of the pond before the first frost. Cut off excess foliage and roots and replant the tuber in a smaller pot. Place the pot in an aquarium (a whiskey barrel or tub will substitute well) with several inches of water over the crown of the plant. Next, put a heater in the water and keep the water a constant 70-75°F. Then, put a grow-light over the aquarium, supplying at least fourteen hours of light: four fluorescent bulbs held twelve inches above will do well (equivalent to about 1500 foot candles). Don't fertilize the lily while it is in the aquarium; it's a time for rest, not growth. In its temporary pond, the lily will grow small leaves that float to the water surface, and it may flower. To help retain heat and humidity, try covering with plastic or glass with a little ventilation.

THE TUBER METHOD

Another method to overwinter a tropical waterlily relies upon drying down the lily for the winter. First, bring the lily inside to a cool, dark place before the first frost. Let it gradually go dry over a few weeks. Remove spent flowers and foliage. When the lily is dormant, remove the pot and find the nut-like tuber in the soil. Wash the tuber so that it is free of soil and cut off any remnant roots to the base of the tuber. Place the tuber in damp (not wet!) sand or peat moss in a plastic container with a lid. Poke a few holes in the lid to allow for air circulation. If desired, treat the tuber with fungicide before storing it away for the winter.

> "... different METHODS of care are *unique* to the two GROUPS of waterlilies."

Keep the container in a cool, dark place, such as a garage, a basement, or a wine cooler set at 55-60°F. Make sure to mark the container with the name of the lily to avoid confusion in the spring. Check the tuber often to make sure that it is not soft or discolored and to ensure that the sand or peat moss has not dried out completely. When spring returns, repot the lily and return it to the pond. The renewed moisture, along with the warmth and sunlight, will quickly prompt the lily to start growing.

Hardy waterlilies are primarily day-length dependent, relying on the total amount of sunlight they're exposed with to tell them when they should start growing in the spring or stop growing in the fall. In the fall, some develop "indicator leaves" that remain underwater at the base of the plant throughout the winter. They are thin and transparent, much like the little leaves of bib lettuce. These leaves allow the plant to know when the days are getting longer and signal when new growth should begin. In the fall, these indicator leaves should be left untouched, while other foliage may be trimmed away. Once trimmed, submerge the lilies to a depth in the pond where they will not freeze, about 2 to 3 feet is sufficient. If ice forms in the dormant rhizomes, they will turn soft and rot, as do frozen potatoes. Another option is to remove them from the water garden and keep them cool, dark, and damp. In the South, where the lilies will not be subjected to freezing water, simply let the plants stay in the pond so they will go dormant in the winter and come back rested in the spring.

These methods apply uniformly to all the cultivars of waterlilies. It's not advisable to force hardy waterlilies to continue growing throughout the winter. If they are forced to grow, they are unlikely to prosper or grow for many seasons after.

MICROBE-LIFT® ENSURE

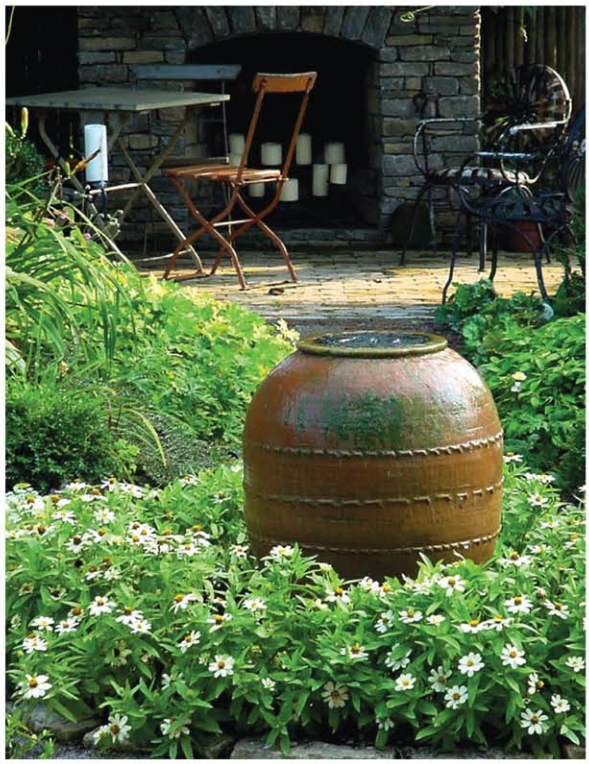
With a bit of COMMON SENSE and a little care, your waterlilies are sure to SURVIVE even the toughest winters.

Kick it up a Notch!

by Max Hammond

Each year technology advances in the water feature industry and our choices become broader and more dynamic. The challenge with this growing myriad of choices is that sometimes we can corral ourselves into a thought that each product is created in its supremacy, and we forget to think outside of the box in which it comes. While it is true that technology is our friend, let's remember that we are the ones that created it, and we need to continue to improve upon the improved.

For instance, let's look at a skimmer. Skimmers have revolutionized the water feature industry. Where there once were only a few manufacturers of skimmers, there are now many. Skimmers have certainly improved over the years and the competition between these manufacturers has greatly benefited the water feature community. We now have many easy to maintain units where brushes or filters can be quickly removed and washed or replaced. These skimmers are great components for our water features that provide mechanical filtration of the water before the pump pushes it up to its destination, perhaps a biological filter that will cleanse the organic impurities and toxins from the water.



THIS JARDINIÈRE IS THE FOCAL POINT OF THE PATIO WHERE THE FAMILY ENJOYS NIGHTS BY THE FIRE.

One thing we need to routinely ask ourselves is, "How can we (in the words of Emeril), 'kick it up a notch?'" What can we do as designers and installers to make our canned solution of a skimmer different from the other installer's? Why not consider hiring a plumber to place a water spigot next to the skimmer enabling the owner to spray off the mechanical filter when he wants to? Or how about this – why not place a drain in the bottom of the skimmer to drain it when you want to clean the skimmer out? While it is true that skimmers rarely need cleaning out, your pond will always provide more value when these little amenities are present. If you are a contractor you will obviously be in a position to place a premium on such improvements. On the other hand, if you are a pond owner you will be the talk of the town for having such a well thought out water feature.

WATER FEATURE IS UP AGAINST THE HOUSE AND THE BRIDGE IS THE FAMILY'S PRIMARY ENTRY IN THE REAR OF THE HOME WHERE THE KITCHEN AND GREAT ROOM ARE.

Technology has also brought about auto-fill water levelers to our industry. The typical installation today will have a mechanical unit that has moving parts that wear out. I despise the little rubber stoppers that wear out in about a year. Usually this failure is followed by a disgusted client calling about a water bill that is greater than their monthly Jaguar payment. The pool and spa industry has been using a product by Levelor for years that electronically maintains water levels. These units can easily be tied into existing irrigation or household plumbing systems. The only moving part is a proven irrigation valve. In the event of a failure the control unit will shut off if water runs more than twenty minutes. Again, this is added value to the end user providing a mechanism to indicate that something is wrong.

I do a great deal of consulting with other small businesses inside and outside of our industry. I have a passion for kickin' it up a notch. Many times I will encounter an unwillingness of business owners to think about raising their standard. Comments like "This will never fly in my neighborhood," or "Our clients are not willing to pay for that kind of innovation," frequent our dialogue. To that I say "You are probably right; however, when these same clients are clients of the innovative contractor, rather than your clients, they will be willing to pay for it, and you will have lost your opportunity to capitalize on innovation."

My favorite example of someone taking existing technology and improving upon it to show innovation comes from one of my favorite pastimes . . . drinking coffee. It had been many years since the electric coffee maker (i.e. the technology) had been developed and installed in nearly every restaurant and gas station across the United States of America. In most cases a cup of coffee could be acquired for twenty-five cents. But in 1983, a man by the name of Howard Schultz visited Italy and was overwhelmed by the popularity of espresso bars in Milan.

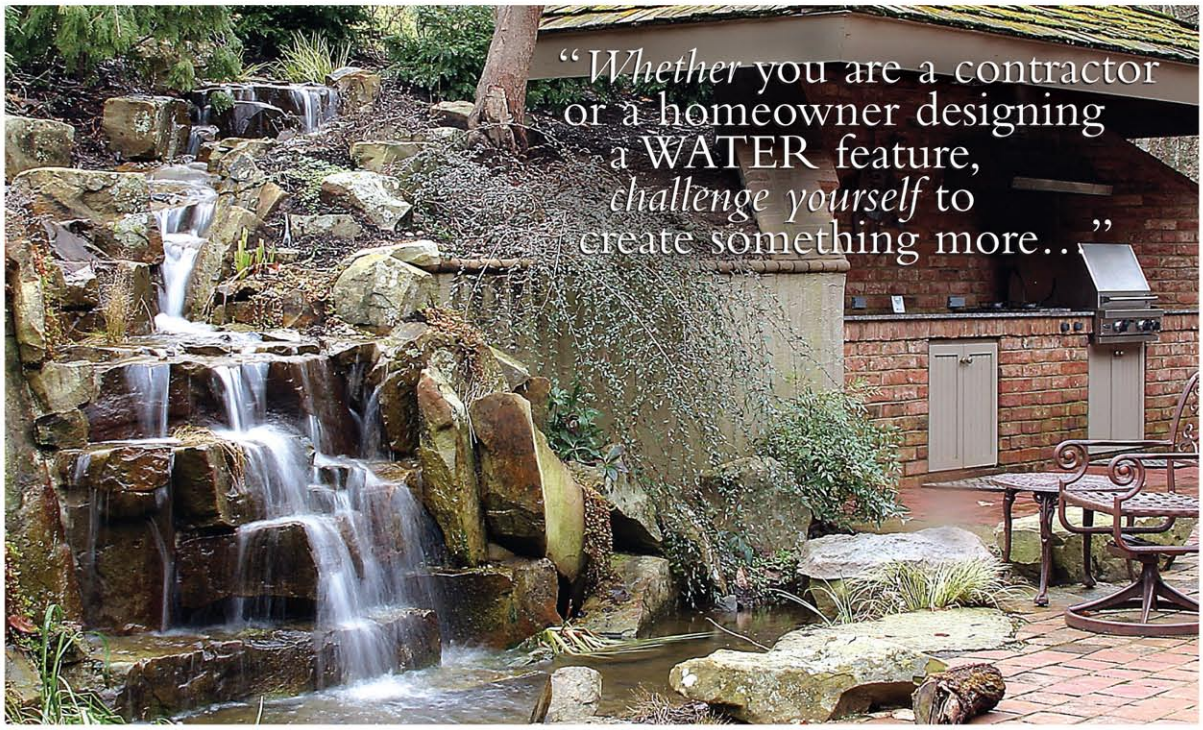
By 1984 he had convinced the founders of Starbucks, a provider of fine coffee to restaurants and espresso bars, to test the coffeehouse concept. The rest is history after about four bucks a cup. Why is this? Why can Starbucks demand such greater compensation to provide a simple cup of coffee? I submit that it is shear innovation. Indeed, it is great coffee and I can testify that I spent more at Starbucks last year than many spent on their water bill. In addition, I valued every cup because Howard Schultz convinced his colleagues that they could take the technology of an electric coffee machine and a building and improve upon it to the point they could demand four times what the existing market could. And the saga continues as customers return for more good coffee and a great experience.

Isn't this how we should approach our industry? Several years ago contractors and homeowners alike installed water features the same way gas stations used to serve coffee. And the industry bloomed into a flourishing market. Now some would say some of the novelty has been diminished due in large part to the canned approach to water features. However, some of the more innovative contractors now offer environments where one can own an extravagant grill next to his water feature where the fridge is under the sink that hangs in a granite top cabinet that shelters the ozone generator for the Koi basin. This is kickin' it up a notch! And guess what? They are selling like hotcakes and demand a premium that enables contractors to serve their customers like a butler serves his king. This creates a raving client who will let his neighbor know how great his contractor is! I hope that you are the contractor providing this experience, and if you aren't, I hope for your sake that you are the homeowner experiencing this environment!

In summary, I hope that you challenge yourself. Whether you are a contractor or a homeowner designing a water feature, challenge yourself to create something more than what can be assembled from the standard components shipped to you in a box. If you aren't sure of your idea, then run it by an expert who can help you. We install water features from the mid-twenties to over a million dollars and often call upon assistance to help us with a new idea. We routinely find assistance within the National Association of Pond Professionals (www.nationalpondpro.org) and other para-trade organizations. As a result we have developed some outstanding cross marketing relationships that have yielded unparalleled returns. We also have created a raving clientele that values our innovation and is willing to pay for it. So what do you say? How about joining in, and let's all kick it up a notch!

THIS STREAM IS AGAINST THE BACK PATIO AND IS SPECIFICALLY DESIGNED FOR A HOME OF FOUR KIDS UNDER THE AGE OF FIVE WHO LOVE TO PLAY IN THE WATER.

THIS WATER FEATURE IS IN THE CORNER OF THE POOL DECK WHERE THE FAMILY LOUNGES WHILE WATCHING THE KIDS SWIM.



WATER FEATURES NEXT TO OUTDOOR KITCHEN MAKE FOR PICTURE PERFECT ENTERTAINMENT AREAS

Pond Construction

by Tom Burton

PHOTOGRAPH BY RICHARD WOLFERT

The first step is to lay out the pond perimeter using powdered lime or a rope or hose to see what this thing is really going to look like in the spot you've chosen. Again, it's probably good to leave this for a couple of days to see if that's what you really had envisioned. Then, start digging. If you live in an area where ice might be a problem, slope the sides about 20 degrees so the ice can slide up as it expands instead of straight out (and through your liner). Dig out the trench for the 4" bottom drain pipe and run it all the way to where the rest of the filter system will go. If a straight shot is not possible, use 45-degree elbows to raise or turn the pipe rather than 90's. The fewer bends the better. Put the bottom drain and all the pipework in place to check all the measurements before gluing. It's a good idea to cover the whole top of the drain to keep dirt out. If the drain is sitting on firm virgin clay/soil, there's no need to set it in concrete. The weight of the pond water will hold it steady.

Returns from the pump and filtration system to the pond are usually via a waterfall and a couple of through-the- liner bulkhead fittings that allow for the creation of a current by using directional "eyeball" (spa) fittings or 90 degree Fernco elbows with the clamps removed (so the fish don't hurt themselves) and glued to the pipe out of the bulkhead. Don't be afraid of the through-the-liner returns. Just be sure to tamp the backfill around each pipe so they're in a solid setting. It usually takes two people to install them and only go arm's length down the side - one person holds the outside of the fitting outside the pond (male threaded) while the other tightens the nut that sandwiches the liner against the flange (female threaded) for a water-tight installation. A bit of aquarium-safe adhesive wouldn't hurt either.

Tip: *Inch-and-a-half PVC, schedule 40, is good for most water transfer functions. However, if the run is longer than about 15 feet, 2" works better by reducing flow resistance. If flexible PVC is used, be sure to use the PVC cement made for it. Also, always use PVC cleaner before gluing (a clear one is available if you don't want to see all the typical blue around joints).*

Tip: *Fernco couplings make pipe joints simple. This is a rubber coupling with stainless steel clamps and comes in many configurations and is available at home centers and plumbing supply houses. After installation, check for tightness periodically if used near pumps. They have been known to loosen, detach and allow depletion of an entire pond.*

Tip: *Skimmers are really "nice-to-have." Either the inexpensive (about $40) aftermarket one or a swimming pool type that installs in the liner just like it does in a liner swimming pool. They keep the surface looking great and both require a pump to operate (external is best - 2000 to 2400 GPH).*

"put the bottom drain and *all* the PIPEWORK in place to *check* all the *measurements* BEFORE gluing."

You've already decided whether you're going to have a partially raised pond and what that structure will be made of and look like, or you know what type of stone you're going to use around the place. ***The rule here is to hide the liner and the plumbing.*** The water level should always be a little above the exposed liner inside the pond. This means that the liner must not only go under rocks placed around the edge of the pond, it must come up behind them as well. To accomplish this, a shelf an inch or two below the intended water line is in order (remember, you know where the water line is going to be because of the levels shot with the transit). Hiding that back edge or tip of liner can be accomplished by using overlapping rocks, plants, decking, you name it. Here's where your imagination comes to play. Just don't let it show either inside the pond or out. Decide how the excavation at the top perimeter of the pond should be done to arrive at the look you intended. Its a good idea to steer clear of a necklace (see diagram A) or swimming pool look except maybe for a partially raised pond.

Tip: *The edge of the pond should be slightly higher than grade so that rainwater doesn't flow into the pond.*

Now's the time to check the dimensions of the pond again and calculate the size liner you're going to need. Length plus 4' plus (depth x 2'), and width plus 4' plus (depth x 2'). That 4' in each direction is to give you 2' overhang all around. Thus a pond 25' x 13' and 3' deep needs a piece of liner a minimum of 35' x 23' plus any for bog garden, streams or waterfalls. If the stones you're using are more than 18" wide, you will need to add liner accordingly. The rule of thumb is, if water is going to be there, there must be a covering of liner AND a lip at the back to contain it. Don't forget to include a planned stream or waterfall. They need to be lined as well and the water contained on the sides (with the liner hidden of course). One contiguous piece for everything, to include the water garden if that's in the plan, makes it a lot easier but there is an EPDM bonding material that does well when applied properly. Or, there is an EPDM tape that will work if applied with care and correctly. There are some good diagrams and examples of perimeter treatment in the Tetra Encyclopedia of Koi and though this book is an excellent reference, it's rather dated, particularly in filtration, so check with other folks before accepting the material as gospel. The fundamentals are all there but technology and new developments have passed it by.

Now the hole is perfect and its time to lay a padding for the EPDM. Old carpet works well, as does sand or carpet padding, almost anything that will give a bit of cushion and help the liner resist puncture from underneath. Once that's in place you're ready to lay the liner. And since its pretty heavy, fellow club members or friends are needed for this operation. One method is to lay the whole liner out and roll it up from the sides to the center lengthwise then tie it in a few places to facilitate carrying by you and your friends. Then march single file through the hole, placing the liner properly lengthwise, then roll it out from the center and up the sides. Another way is to get six people to hold it out over the hole then gradually let it drop into place. Once it's in the proper position, smooth out the bottom over the hole for the bottom drain, mark the hole with a Magic Marker, then cut the hole in the liner as neatly as possible with a utility knife. Then apply a fish friendly (aquarium safe) adhesive/caulk between the liner and the bottom drain, then on the collar that will sandwich the liner and the bottom drain together. With the collar in place install the screws or whatever fasteners came with the drain trying to apply equal tightening all around. Wait for that to set-up according to the directions for the adhesive, then proceed to lay the liner so as to avoid as many folds and wrinkles as possible (this the major down side to using a liner - some folds and wrinkles can't be avoided and will harbor crud). This was my saddest day as I couldn't imagine getting that huge sheet

"I *couldn't imagine* getting that HUGE sheet of rubber to flatten … it mainly did and *once covered with algae,* and with GORGEOUS *fish swimming* around I don't notice it anyway."

of rubber to flatten out and look like anything - but of course it mainly did and once covered with algae, and with gorgeous fish swimming around I don't notice it anyway. As the pond slowly fills it's possible to work even more wrinkles out as the weight of the water starts to work in your favor. It's not a good idea though, to stretch the wrinkles out by letting water act as air would in a balloon - this ends up thinning the liner. Some folks have filled their pond, left it sit for a few days, then pumped it out and started the wrinkle removing process again as they refilled. They say it helped. Also, the use of 6" EPDM tape can help flatten and seal major folds. The anti-vortex domed top for the drain should be set about 1 1/2" off the bottom.

Tip: *When filling the pond, water should be metered so you will know FOR SURE how much is in there AND in the entire filter system together. You'll need this info if/when you must treat for parasites or other baddies as dosages are based on water volume (and no one I ever heard of has gotten away without some).*

Tip: *DO NOT CUT excess liner until you are SURE it isn't needed. This is a lesson learned the hard way by too many of us.*

Now to the filtration system. At this stage you should have the system all hooked up and in place or have all the necessary parts on hand. You've kept the water in the pond from running out the drainpipes by closing the knife valve for each. Look at the attached filter diagram (B) as only one of many ways and means to arrive at the same end; good water quality. The filter system is the key to that and if we don't have good water quality, we can't keep koi (very long) - period. The system incorporates bottom drain to settling chamber to mechanical filtration to biological processing to pump to pond. It doesn't matter what the containers look like, or what their shape is as long as they hold water and don't lose their shape when filled. The settling chamber won't work if we feed it too fast. The mechanical filter won't work if all the water isn't forced to travel through the filtration media. Likewise, the biological processing station won't work if the water can go around the media you've selected as the home of the good guy bacteria. Water will seek the least line of resistance and all of your efforts will be for naught if it doesn't go THROUGH the media. Also, match the media to the type container. Brushes do well in round, or straight-sided square or rectangular containers. Ribbon type media goes in either as well. Ribbon material will try to sneak out purge drainpipes if you don't contain it (say in nylon drawstring laundry bags or by having a grate at the bottom of the container). However, these are just a few of the potentials for media so ask and look around. They are ones I've used successfully though.

Now we can start up the pump and test our recirculating, gravity fed system. The pump should obviously be outside the pond and move 2000 to 2400 GPH. It normally doesn't have to create much head or pressure as water falls should neither look nor sound like Niagara Falls. The effect should be soothing, not kinetic or frantic but that's a personal thing I guess. Most of the water being pumped will go to the through-the-liner returns to create the current we mentioned earlier. The fish love it and the crud is moved to the bottom drain where it belongs. There are several choices of pumps and any one that uses around 3 amps and is quiet will do just fine. Most have 1 1/2" input and output connections. If you're going to use 2" pipe from (and/or to) the pump, just use a 1 1/2" to 2" coupling. Installing a ball valve (Teflon ones are best) on the output side of the pump for complete control, and a flow meter that displays 20 to 80 GPM, are highly recommended.

Tip: *Amps x voltage = watts x 24 hours divided by 1000 = kilowatt hours (KWH). Example: 3 amps x 120 volts = 360 watts x 24 hours = 8640 watts divided by 1000 = 8.64 kWh x rate charged by the electric company per kWh (mine is 15 cents) = $1.29 per day to operate the pump (or $38.88 per month).*

Tip: *Union couplings on the input and output side of pumps make for quick disconnects.*

You're up and running now and have used some type of dechlorinator to neutralize the chlorine in the water and are ready to add a few fish who will provide the food (ammonia) for the good guy bacteria to get started. Remember that our biological processing station is only RE-active and never PRO-active so it always has to catch up to any increased bio load (so we never want to add a lot of fish all at once).

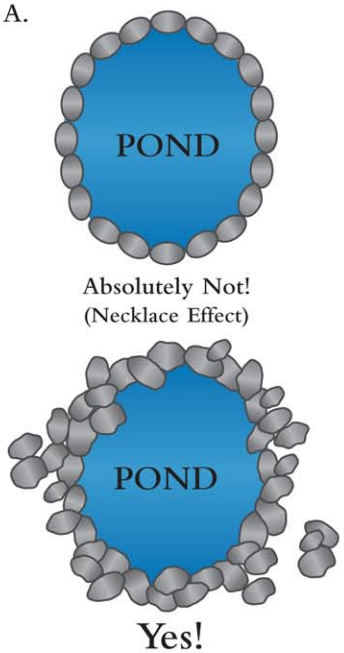
MICROBE LIFT® DECHLORINATOR PLUS

Tip: *Call your water company and ask if they use chloramine to get rid of bacteria. If they do, you need a neutralizer that attacks that specifically. Just read the label on the product.*

Tip: *It will take a couple of months for your biological processing station to "kick in" and start giving you zero on your test readings. The British and Japanese, and I agree, that we should never shut our filtration systems down (except to clean of course) because it takes a couple of years or so for a system to become mature. If we shut it down every year we have to go through that bloody "new pond syndrome" (spelled green water) every spring. And, we never get maturity. Going through it once at the very beginning is bad enough.*

Tip: *An ultra-violet sterilizer is the best way to get rid of suspended algae (which makes our water green). The wattage needed depends upon a lot of things, such as nitrate in the water and hours of sunlight on the pond (algae is a plant after all and needs food and sunlight to thrive). A 40-watt UV with water flowing through it at 900 GPH, works very well for most ponds (4000 to 6000 gallons). If you need more power and water is run through two 40-watters one after the other in sequence, you can increase the flow to 1800 GPH (or 3 to 2700 GPH, etc.) Those are figures I know to work but the hobby has more art to it than science so a little deviation either way probably wouldn't matter. A branch off of one of the returns or even placed in a return line, can supply the water but you'll need to know what the flow rate is. Installing a flow meter in the line will take care of that and the ball valve on the line after the pump will be your control. The alternative is a separate small submersible pump (of the type without oil in it) picking up water from the processing station or the mechanical filter and pumping to the waterfall or even from one container or section to the other, will work.*

A.



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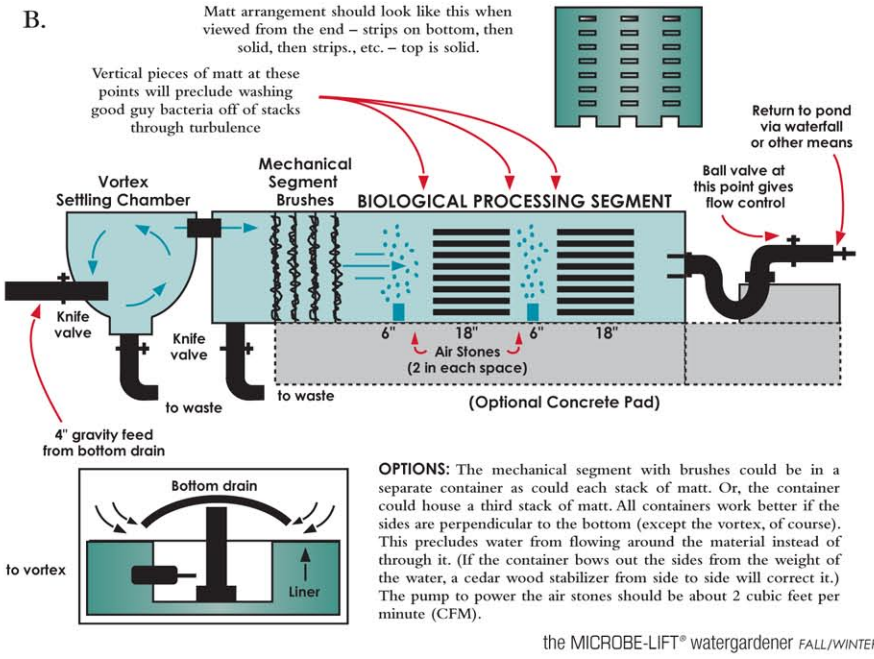

OPTIONS: The mechanical segment with brushes could be in a separate container as could each stack of matt. Or, the container could house a third stack of matt. All containers work better if the sides are perpendicular to the bottom (except the vortex, of course). This precludes water from flowing around the material instead of through it. (If the container bows out the sides from the weight of the water, a cedar wood stabilizer from side to side will correct it.) The pump to power the air stones should be about 2 cubic feet per minute (CFM).

"...no MATTER what the weather *looks like* today, there are a few more CHORES to do so our POND inhabitants can *safely* traverse the *cold months* ahead."

Closing the Pond

by Carolyn Weise, Ecological Laboratories, Inc.

In the northern states summer is simply TOO SHORT. But now that the season is drawing to a close, no matter what the weather looks like today, there are a few more chores to do so our pond inhabitants can safely traverse the cold months ahead. So, let's talk about when to stop feeding, covering the pond (or not to cover the pond), and whether or not to leave the filter running… Let's also look at parasite protection and giving our finny friends the best shot of not being breakfast, lunch or dinner as they sleep. And, finally, let's look at which MICROBE-LIFT products will make your life easier this time of year.

FEEDING is an important responsibility for the pond owner. Learning what is nutritionally sound, has all the necessary ingredients in the correct amounts for your specific fish, where to get this good food, and then, of course, when to feed. While most pond goldfish are not that particular, and will supplement their diet with insects throughout the active season, koi have more stringent requirements. Their food has become innovative and sophisticated. It doesn't preclude a healthy balance of ingredients simply because it has an attractive name. MICROBE-LIFT/Legacy foods have no Japanese name. They have done extensive research and development in processing to preserve the ingredients for the fish. In the heat of summer, everyone is feeding their koi the high-protein, high-growth foods. But when temperatures start to drop and days shorten, the Cold Weather wheat germ foods are the best to feed. Monitor your water temperatures. And watch the weather forecasts. This will give a reasonable gauge as to when to cease feeding. It still takes four days for today's food to be eliminated from your fish. Food left in the digestive tract will most likely cause gas, like it does in me if I go to sleep on a full stomach… *(These days, I feed when the fish are active and swimming, and I stop entirely when they settle to the bottom. But below 55°F, I feed nothing but MICROBE-LIFT/Legacy Cold Weather wheat germ food with the pale beige label.)*

COVERING THE POND is an individual choice. I bought a large net to cover my pond, to keep out leaves and debris, but measured a tiny bit too small. Thus, I have to really stretch it to cover the larger part of the pond, and it doesn't go as far as my bogs. In effect, any leaves can easily blow into the pond through the many other entrances in my case. And, it takes two people to pull on the too-small net to secure it. Basically, I used it one time and now it sits in the garage. Maybe I will donate it to a deserving koi club member this year. But, the more debris you keep out of the pond, the better for the fish. I get calls from people all the time with the idea that fish need a layer of leaf matter to rest in over the winter. BAD IDEA! Parasites and undesirable bacteria need a layer of leaves to rest in. Not fish. Fish need a clean environment in winter, same as they do in summer. So, consider netting your pond or constructing a barrier to protect your fish from objects that blow during the cold winter months.

FILTRATION should be continuous, 365 days a year. In the winter months, your filter will be less a filter and more a circulation device. Some people choose to use an aerator, set near the surface, to prevent freezing. It doesn't completely work. Aeration set on the bottom will have the water circulating from top to bottom. A filter should be running to circulate water "around" the pond. This helps preserve warmer temperatures at the bottom of the pond, where the fish are. What can be done is to reduce the flow rate to up to 10%, so it is a gentle flow, but still filtering out larger particulate matter as it settles into the pond. A clean pond is a healthier pond for your fish. Even though they are not actively feeding, they will be giving off ammonia, fish urine and carbon dioxide. I recommend keeping the filter on. During the cold months, biological activity ceases below 45°F. This is an ideal time to use MICROBE-LIFT/Autumn Winter Prep, with the cold-weather strain of bacteria that will work beneath snow and ice, and the water-soluble cellulase packets that accelerate the breakdown of any leaf matter.

WATER CHANGES are still a necessary part of pond regimen, even in winter. With limited biologic activity, water changes will provide relief of any built up gases and toxins in the water. I do 10% water change, as weather permits, monthly. This means dragging out the hose, connected to the bathroom faucet, to refill, because I have disconnected and blown-out the automatic refill for the season by the time of the first freeze. Although cold water may not contain as much chlorine and chloramine due to lower bacteria counts in the public water supplies, I always use MICROBE-LIFT/Dechlorinator Plus before adding new water. I am not willing to take a chance on burning my fishes' gills and reduce their breathing capacity next summer.

PARASITE PROTECTION is something we all worry about. During fall and winter months we have basically no other predators to worry about in the north. But parasites are always there. Get a microscope. Learn how to use it. Take a fish health course. Then you will know WHAT you are treating for when you dump chemicals into your beautiful pond. Salt is a great first-line product, easy to use and easy to get, but you still need to know why you are using it. Most parasites are not visible to the naked eye, so guessing at what is wrong with the fish has killed more fish than parasites.

Then, when you know what it is you are looking at, what you may be dealing with and how to treat it, you will feel secure in using the MICROBE-LIFT/Pond Fish products: Pond Fish Protectant, Pond Fish Healant, Pond Fish Parasite Treatment, and Pond Fish Anti-Fungal Treatment. Or, you can take your fish to a veterinarian that knows fish. Then use the above-named products with the assurance you are treating the right parasite symptoms or disease.

"…consider netting your pond or *constructing* a barrier to protect your FISH from objects that blow *during* the COLD winter months."

MICROBE LIFT® AUTUMN/WINTER PREP

featured MICROBE-LIFT® dealer

THE FROG BOG
WWW.THEFROGBOG.COM

Carolyn: Hi, Bob – how did you get started in the water gardening business?
Bob: I have always enjoyed the sights and sounds created by streams and waterfalls. I began damming small streams as a kid. I'd build a dam, then knock it down and build another. After many years of installing water features, and with the help of several friends, we started a local pond club. Several of the members had come to me and asked me to open a retail store where they could come for advice and to have access to a larger variety of aquatic plants than the local garden centers carried. I found a great location and opened the store.

Carolyn: What about this business do you find most gratifying?
Bob: My favorite part of the business is when a customer comes back to the store after building their own pond. They bring pictures of their new pond and thank us for all of the help we've given them. The expression on their face and the pride for their pond is what I enjoy the most.

Carolyn: What is the most frustrating part of running a water gardening business?
Bob: Trying to find solutions to the problems created by "professional" pond installers that attended one class somewhere and think they know everything about ponds, and then go out of business because they can't keep up with the complaints.

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Carolyn: On the average, how many hours do you put into your work, helping customers, keeping shelves stocked, building ponds, giving advice?
Bob: Living in Wisconsin, our pond business is very seasonal. I go to garden and pond exhibitions in January, have a booth at a local garden show in February, then teach pond classes at my store. Most of my inventory is delivered in March and receive, price, stock and store it. I also give talks to garden clubs from September to March. My store opens April 1 each year. My 40+ hour weeks when the store is closed for the winter turn into over 70 hours per week by April. This continues until August when the business begins to slow. After Labor Day, we are only open three days a week, when I can get back to about 40 to 50 hours per week until we close after Christmas.

Carolyn: Do you have a family? And how does your family feel about you spending so much time with customers?
Bob: I have been extremely lucky to have family help me throughout the year to let me keep my dream alive. I have a wonderful wife, three great girls and close friends. They have all helped me with my retail business. I wouldn't be in the business today without their help.

Carolyn: Where did you get your knowledge from?
Bob: When they didn't teach about water gardens in college, I decided to learn about them myself. I read about ponds in books and magazines. I traveled the country, going to garden centers and talking to professionals who installed ponds. I talked to people on pond tours to find out why they built their pond a certain way. I learned that there's more than one way to build a pond. I learned that there are many types of ponds that used different components and all can work for you. Some just take more care than others. Then, after many years of research, I began building ponds for friends and relatives to find out what type of pond worked best in my area. I began designing and building ponds professionally after that. We installed or consulted on over 1400 ponds when I stopped counting. We came up with many new ideas for specialized water features. Although disappearing waterfalls and streams (those with no ponds) have become quite popular in the last 2 or 3 years, we began installing them over 12 years ago. We also have developed ponds with no filters that stay perfectly clear with no more than an hour of maintenance a year. We have built ponds with no moving water that have also stayed clear for years. I don't generally build water features anymore. I have trained several individuals on installation, and continue to consult with these installers so they can learn to install the best quality water feature for their customers. I also continue to take classes about water quality, plants and fish from biologists, chemists, fish vets and horticulturalists. I still travel around the country talking to pond professionals and pond hobbyists.

Carolyn: Who helps you when you don't know how to answer a customer's question?
Bob: I've been and continue to be fortunate to be around some very knowledgeable people. By anticipating questions and learning about new products before I sell them, and by having years of experience, there hasn't been a customer question that I haven't been able to answer. Fortunately, customers usually don't ask very technical questions. I'm not as knowledgeable on fish disease as I would like to be, so I continue to rely on people like Dr, Myron Kebus, who lives nearby, and some of the internet websites I trust, to help me out.

> "... I learned that there's *more than* one way to build a POND."

Carolyn: What products do you get the most call for?
Bob: Live pond bacteria, pond liner and underlayment are probably the most asked for products at my store.

Carolyn: What would you like to say to your customers?
Bob: Continue to ask questions BEFORE you build. This can save you lots of time, money and frustration. And, thanks for your continued visits to my store. I love talking pond!

Carolyn: Thank you, Bob, for your dedication and for sharing with our customers! We look forward to hearing from you again in the future. Your business success speaks volumes to your dedication and I know you are really making a difference in people's lives. So, if anybody is in the area of 100 Lincoln Street, Verona, WI 53593, please look Bob up and tell him how you liked his interview! Or if you are just passing through, stop by and say "HI"!

We are spotlighting your MICROBE-LIFT DEALERS by bringing you interviews with the people who actually serve you and have the information that will benefit your hobby! In this issue we are meeting with Bob Rieser, owner of The Frog Bog which can be found on line at www.thefrogbog.com. Bob has a real affinity for natural solutions to pond keeping problems! And that's what Ecological Laboratories, Inc. is all about...

The Rest of the Story
(on the Nitrogen Cycle, that is)

by Mark Krupka of Ecological Laboratories, Inc.

In last issue's article, we talked about the basics of the nitrogen cycle, particularly nitrification. This article will deal with a less recognized part of the nitrogen cycle but one that can be equally important in keeping a high quality of water in your pond – denitrification.

Denitrification, because of the name, is often confused for or used interchangeably with the term nitrification. In fact, if anything, it is the opposite of nitrification. Denitrification is the chemical reduction of nitrate to nitrogen gas. The advantage of this is that it is a way to eliminate excess nitrogen from your pond without having to lower it through partial water changes. The benefit of this is you can reduce or eliminate conditions that can lead to unwanted growth that can be supported by these excess nutrients – like algae blooms.

When most people hear that denitrification is the reduction of nitrates, their interpretation of reduction is a lowering of the value. While this does occur with denitrification, as it is used here the term "reduction" refers to the chemical reduction as in oxidation-reduction reactions. In chemistry when any substance is oxidized a concurrent chemical reduction must occur. In the case of denitrification, under conditions when there is not enough dissolved oxygen available, certain types of organisms called "facultative anaerobes" are able to take oxygen from other sources – including oxygen bearing compounds like nitrate (empirical formula NO3) which contains three oxygen atoms. Organics get oxidized to carbon dioxide and the nitrate gets reduced, losing its oxygen and leaving behind a nitrogen (N) atom. This N atom isn't stable on its own so it finds another N atom, combines with it to form N2, or nitrogen gas. As any other gas you would introduce into the pond, the nitrogen gas just bubbles out of the pond to the air.

As mentioned above, denitrification occurs in an environment where there is not adequate dissolved oxygen. It is not desirable for your pond to be devoid of oxygen because the fish and other aquatic fauna in your pond need this dissolved oxygen. How then can you safely achieve denitrification in your pond while still maintaining an oxygen rich environment for your fish?

The answer is your filter or skimmer. Most filters are designed to perform mechanical filtrations, i.e. the removal of particulate matter like twigs and leaves, etc., and biological filtration, i.e. the removal of organic and inorganic pollutants in the water through natural biological processes. The "biofilm" may only feel like a slimy coat but this may comprise many layers of bacteria, which have different properties from layer to layer. If the filter is properly sized, there will be an outer aerobic layer of bacteria and a second layer of facultative anaerobes and, finally, a layer of anaerobes. As nitrates from the water pass through the aerobic layer they are not affected but denitrification can occur in the layer of facultative anaerobes. As a result, total nitrate levels in the water can be lowered, removing one of the keys nutrients supporting unwanted growth.

MICROBE-LIFT PL and **HC** contain denitrifiers that can aid in this process. In fact, in a very impressive river remediation in China in which a polluted river was successfully treated with **MICROBE-LIFT PL,** one area of improvement was the lowering of the total nitrogen values in the river, a measurement of pollution in the river, by more than 60%. Organic pollutant levels were also lowered and toxicity in the river was eliminated.

If **MICROBE-LIFT PL** can do that in a river, imagine what it can do in your pond.

(Go to our website for the full technical article on the Xiba River project written by Professor Hu Kaelin, one of the leading water quality specialist in China)

An Introduction to KOILAB

by Victoria Burnley-Vaughan
Director of Aquatic Services College of Veterinary Medicine, University of Georgia

Koilab was founded three years ago to provide affordable diagnostic services to koi hobbyists, producers, retailers, importers and veterinarians. Tissue samples or whole fish for necropsy can be sent by the individual. Samples are then disseminated to five University laboratories for analysis. Information is then compiled, the client is contacted and hopefully a diagnosis is made. Koilab does not recommend or provide any treatments or medications. It is strictly a diagnostic service.

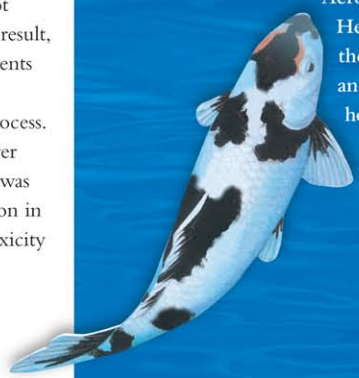
Some tests require more time than others but in the case of a KHV outbreak the client is contacted immediately. Some tests have a 48-hour turn around. Others, such as the serological assay, may take 2 weeks.

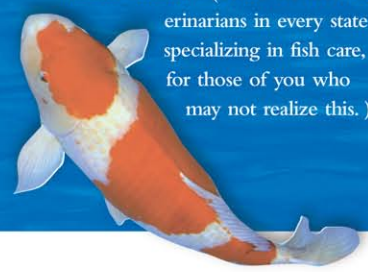
Services include:

- **Necropsy**
- **Histology**
- **Serology (blood test for KHV)**
- **Water testing (pH, hardness, and 18 trace elements)**
- **Bacteriology (culture and sensitivity)**
- **KHV PCR**
- **KHV In Situ hybridization**
- **Parasite screening and identification**

Some tests are only applicable to live fish such as parasite screen and histology. The KHV PCR can be run on live, freshly dead or frozen specimens.

It is absolutely imperative that the client calls before submitting samples (706-247-6274). Vicki Vaughan is responsible for all sample submissions and if she is out of town they will be neglected. Submission forms are downloaded from the website at www.samples.koilab.com and included with the specimen and payment. Editor's Note: Koilab is located at the University of Georgia and is available to anyone seeking diagnostic services, answers to why their fish are dying or other problems within their pond. Vicki is a renowned lecturer and researcher. She has worked for a cure for Aeromonas, Pseudomonas and the dreaded Koi Herpes Virus that has wiped out many ponds in the US. She offers educational labs at koi shows and at the UGA for people interested in learning how to better care for their fish. Vicki began a Breeding Program Lab in 2006, in addition to health seminars. (There are also veterinarians in every state specializing in fish care, for those of you who may not realize this.)





"…eliminate *excess* NITROGEN from YOUR pond *without* having to *lower it* through partial WATER changes."

KOI SHOWS COMING SOON!*

July 29-30
Northwest Koi & Goldfish Society,
Location: Portland, OR

Aug 26-27
Pioneer Valley Koi Club
New England Water Garden
& Ornamental Fish Show
Location: Northampton, MA

Sept. 15-17
Atlanta Koi Club Show
Location: Atlanta, GA

Sept. 30-Oct.1
Mid-Atlantic Koi Club Show
Location: Allentown, PA

Nov. 3-5
Piedmont Koi Club Show
Location: Charlotte, NC

***** *For a club in your area, contact Carolyn at carolynw@microbelift.com for listing of clubs in the Water Garden Directory!* ***If your club is having a show or event, let us know early so we can spread the word!!***

I'm a Ponder!

I'm rough an' tough and smarter than any fish! Why do I need to pay some club a buncha money to do this hobby? I'm just fine on my own, right?

Well, probably wrong, and for a large number of very good reasons. Beginning ponders almost always approach the hobby with a significant knowledge deficit, having either been told by the contractor that their spiffy new ponds were "maintenance-free", or having started off with a self-dug pond with limited or absent filtration. Poor water quality and overstocking are the twin curses of inexperience, and are the most common reasons that many beginners never get past their second season as a water gardener.

Ponding is one of those avocations that, like model railroading, is a lot more complex than it looks on the surface. Water quality, filtration, circulation, water testing, planting, stocking, fish health, management of predation, injury, and disease and multiple other interrelated issues all contribute to making ponding one of the most absorbing and challenging hobbies around. It also provides the opportunity for endless disaster for the unwary.

The most effective way to avoid the common (and uncommon) pitfalls inherent in ponding is to find a bunch of experienced hobbyists and learn from them. The most common attribute of any avid ponder is his or her willingness to discuss (at length) every mistake, disaster and goof they've ever committed, and then share their rescues, miracles and solutions. Avid ponders are terminal fidgets, always experimenting and changing their ponds, their filters and their fish. The more of these people that a beginner can interact with, the fewer mistakes he'll make with his own pond.

Hobbyists of any persuasion instinctively band together, and ponders are no exception. Koi and water gardening clubs abound just about anywhere the combination of fish, water and plants are possible. At any given club meeting, a beginning ponder can find upwards of a thousand man-years (or more!) of hard-won ponding experience. Presentation of a problem will result in not just a solution, but very likely many possible solutions, all of which have worked in one situation or another.

Koi societies, water gardening associations, goldfish clubs are vast repositories of knowledge and experience, and are powerful teaching organizations. If you are fascinated by this hobby in any of its many facets, you need to join a club. It'll keep you from making serious mistakes, regardless of your level of experience, and help bail you out when you stumble over the inevitable barriers produced by Ma Nature and Murphy (the Imp of the Perverse).

Bob Passovoy
President, MPKS

PHOTO CONTEST

IN THIS ISSUE WE ARE LOOKING FOR THE MOST INNOVATIVE LANDSCAPE FOR A POND AND CRYSTAL WATER, please explain how MICROBE-LIFT has impacted your life - SEND PHOTO AND ESSAY, 50 WORDS OR LESS, TO CAROLYN WEISE c/o Ecological Laboratories, Inc., PO Box 132, Freeport, NY 11520

HOW TO ENTER - OFFICIAL RULES

Entries must be received by November 30th to qualify. If you are sending digital images, please send them on a CD or by email, at least 4x5 inches in print size, JPEG format. Captions/info for any photos sent should also be provided; please tell us what's pictured. Send to: Microbe-Lift®'s Photo Contest, c/o Carolyn Weise, Ecological Laboratories, Inc., PO Box 132, Freeport, NY 11520 (photographs and slides will not be returned.)

Name of Photographer_____

Date of Photograph____/____/2006

Address_____

Phone Number_____daytime_____evening

E-mail Address_____

Entrant will automatically be eligible for monthly e-newsletters.

2 WAYS to WIN

ENTER TO WIN $150 Toward Microbe-Lift® Products of Your Choice!

CUT HERE

Reader's Survey:

Enter drawing to WIN $150 Toward Microbe-Lift® Products!

1. How long have you been interested or involved in ponds and water gardens?
   a) Brand new b) 1-5 years c) Over 5 years (circle one)

2. Do you currently maintain a pond or water garden? ❑ Yes ❑ No

3. Would you like to receive the monthly MICROBE-LIFT e-newsletter, which you may unsubscribe at any time? ❑ Yes, please ❑ No, thank you

4. What size is your **largest** pond or water garden?
   Length _____ Width _____ Depth _____ Gallons _____

5. In which of the following are you primarily interested? (check all that apply)
   - ❑ Plants
   - ❑ Fish
   - ❑ Filtration
   - ❑ Water features
   - ❑ Landscaping
   - ❑ Equipment for your pond
   - ❑ Predator Protection
   - ❑ Education about your hobby

6. Which of the following water garden oriented magazines do you read regularly?
   - ❑ Water Gardening
   - ❑ Aquascapes Lifestyles
   - ❑ Ponds USA Annual
   - ❑ Koi World Annual
   - ❑ Pond Boss
   - ❑ Koi USA
   - ❑ Ponds Magazine
   - ❑ Mid-Atlantic Koi Magazine
   - ❑ Other: _____

7. Where did you get this issue of The Microbe-Lift Watergardener magazine?
   _____

8. Which of the following is most true of your purchase of this issue of The Microbe-Lift Watergardener magazine?
   (Please select only one of the following)
   - ❑ My Microbe-Lift dealer offered it to me
   - ❑ Saw it advertised online.
   - ❑ A friend told me to look for it
   - ❑ Just happened upon it
   - ❑ My (koi or water garden) club talked about it.

Name_____*Email_____

*Note: This is privileged information and will not be offered, sold or given in trade to any outside institution or establishment. Your privacy is guaranteed. The sole purpose of your email address is for the distribution of a monthly newsletter. You may unsubscribe at any time.

HOW TO ENTER: Please remove or copy this survey from the magazine and mail it to:

Carolyn Weise
Ecological Laboratories, Inc.
PO Box 132
Freeport, NY 11520
or Fax to 516-379-3632

ENTER TO WIN

MICROBE-LIFT®

Fish food specially formulated for the health *and vitality* of your prized pets – it's prepared for the *change in seasons*, too!

Ecological Laboratories, Inc. selected two strains of naturally occurring non-pathogenic microorganisms, (Bacillus subtilis and B. licheniformis) and combined them into **Nature's Building Blocks™,** for inclusion in all the **Legacy Koi and Goldfish foods.** These two strains were selected from over 200 other Bacillus organisms for their efficient enzyme production and other metabolite-producing capabilities under intestinal tract conditions, to promote health and vitality by breaking down carbohydrates, proteins and fats into smaller, more easily digested nutrients.

Considering the impact of intestinal bacteria on health and stress management, this is a significant addition to your fishes' diet. Microbial balance in the intestinal tract may be upset by a stressor, such as shipping, diet change, water quality/temperature change, environmental change, addition of new aquatic life, etc.If the intestinal population of beneficial bacteria decreases and the potentially harmful bacteria increase, it is possible to compromise fish health and performance. It is a delicate balance between these two groups of bacteria and **Legacy** can make the positive difference for your fish.

Nature's Building Blocks™ incorporates three primary foods and several secondary foods for a varied and appealing, balanced diet. Choose from **warm weather foods (growth & energy, summer staple, fruits & greens, immunostimulant, sinking pellets, variety mix, and mini pellets), cold weather (wheat germ), and three tasty treats (crustacean, krill and kelp).** Now, who says healthy has to be boring?

Water temperature is the single most significant factor in determining which type of food to feed. Fall temperatures can fluctuate greatly, but when the water temperature is between 50-65°F, feed **Legacy/ Cold Weather (Wheat Germ) Food** for easier digestion and absorption of nutrients. Make the seasonal adjustment less stressful for your fish.

Ecological Laboratories INC.

Solving Environmental Problems Since 1976

For more product information please visit our website: www.microbelift.com

What's an Independent Retailer?

this magazine is brought to you by your INDEPENDENT retailer

By Carolyn Weise, Ecological Laboratories, Inc.

And why do I want to shop here? The answer can be summed up in three words: service, service, service. Have you ever tried to find the right screw for your electrical appliance or the right connection for a plumbing job at a Home Depot? Don't get me wrong- I love Home Depot. It's just the greatest place for people who know what they are doing in the first place. I can find a microwave oven, choose just the right color paint or pick out a new carpet by myself. But it's not a place for somebody looking for help with a particular problem, especially one they haven't experienced before. I've waited an hour for someone to help me just to find out the guy who knows how to do what I need is out to lunch. It takes even longer to return the wrong parts when I find out I made a mistake in shopping. Nope, if my fish are swimming crooked or not eating, I want a live body listening to me. I want someone to give me a clear answer. I need someone to be willing to share my burden. These are living creatures after all, and I am responsible for them. The last thing I need is, "I'm sorry but this isn't my department"… because they think I'm nuts in the first place. I probably will be carrying on like a lunatic, but most don't understand how important my fish are to me. I get hysterical when I hear things like, "it's only a fish…" The independent retailers, the ones who know about ponds, fish and aquatic life, are the ones who will not only have the answers, they want to help.

So, what do I really need in a dealer? I'd say it is a company that offers explanations and directions on their products and has a phone number with a "real person" at the other end to answer my "dumb" questions. I'd also say it's a company that is as concerned about my fish as they are about my purchase. It's a place you can go for professional help, like seeing a psychologist, and you don't even need an appointment. If you go into a store and are walked though your problems, step by step, and it's a family-owned business, members of the community, perhaps they attend your church or their children go to school with yours, I'd say you've found an INDEPENDENT RETAILER.