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Address Service Requested

Noel and Debbie Shaw's House
May 22
Education Starts at 3:00

SAKA, Inc Club Officers

President	Bob Panter sakabob@yahoo.com (520) 747-7278
Vice President	David Young koiman@mindspring.com (520) 682-7697
Secretary	Lynn Riley (520) 825-9066
Treasurer	Dan and Martha Cover mardan79@msn.com (520) 297-4071

Committees/Points of Contact

2010 Pond Tour	Jeanmarie Schiller Tucsonpondtour@yahoo.com (520) 299-1876
31st Koi Show Co-Chairperson(s)	TBD
AKCA Representative	Debby Young debbyt@akca.org (520) 682-7697
Newsletter Editor	Brent VanKoevering bvankoevering@longrealty.com (520) 780-3980
Koi Health Advisor	Noel Shaw koidoc@noelshawdc.com (520) 400-0335
Membership Chairperson	Faye Hall (520) 297-1253
Raffle Chairpersons	Wanda & Bruce Triebel wkt56@comcast.net (520) 572-0060
Education Committee	Erin Riley elriley@aol.com (520) 818-6490

Editor's Note: Articles published herein are intended for the enjoyment of all and come from a variety of sources. The articles are not intended to replace veterinary advice. Pond owners, and not the club, are responsible for the health of their koi, water changes, what to do, and how to treat their pond. Reasonable effort is made to review these articles for accuracy before including them in the newsletter.

Presidents Corner 5-15-11

From a huge pond tour to Koi Association Meeting, what a way to go. Time flyes when your having fun, and l hope you are.

As we apporach the end of May please check your water quality. Everything is in full swing now and your koi need all the help and TLC they can get. By checkinig the quality of your water you will know weather your koi are in the right enviornment or not. This is important information to have. Your koi will love you for doing this.

Pond Tour 2011, just the greatest thing that has happened this spring. What do you think?
The ponds were something to see, and the surrondings they are in. What more can you ask. A big thanks to all who to the time to help out. What a great job. Thanks again.

What are our goals as a Koi Association? What do you nwant out of are Association? Please take the time and answer these two questions. Send me an e-mail with your thoughts. Thanks in advance.

For the love of Koi,

Bob Panter, President SAKA, Inc.

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Club Meetings

Hosting Meetings: For those wishing to host an upcoming business/education meeting, the club will reimburse the host up to $50 (with receipts) toward food/beverage for the meeting. **We would like to see your pond!** Please contact Bob Panter if you are interested in hosting a meeting.

Club Announcements

Business Meeting Minutes

Date & Location: May 1, 2011, at Martha and Dan Cover's, Tucson, AZ.

Call to Order: Meeting called to order by Bob Panter at 3:37 PM.

Minutes: Motion made to accept and second the April 2011 Minutes as read.

Number of members in attendance: 11 members.

Treasurer's Report: Current checking account balance: $11,931.75. Savings balance: $5,192.51.

AKCA: The Club was requested to vote on Koi Person of the Year. Nominations were: Jean-Marie Schiller, Brent VanKoevering, Karen and Al Johnson and Craig Warren. Mr. and Mrs. Johnson were voted Koi Persons of the Year.

Correspondence: LIM catalog received. AZ Feed carries Mazuri Koi Pellets now; 20 lbs. for $33.39. Fish rescue from Tim Moore donated to Club.

2011 Pond Tour: Pond Tour is to be held May 14th and May 15th, from 9 AM to 4 PM. Jean-Marie has tickets for sale and flyers for the members to put up. She needs volunteers to sit at some of the houses on the Tour.

Old Business: Water Meter cost is $75. Discussion of tool boxes to be added to the trailers for fire hoses, $89. Small tool box, $30, and there was a motion that was passed to buy two big tool boxes. It was mentioned that the pool tubs were received back from Phoenix.

New Business: Plants are available for members. There was a motion passed to have a committee of Lynn Riley, Faye Hall and Martha Cover, to contact past and current members concerning attendance at the meetings and paying dues. Also to get a list of name tags already ordered so those members concerned can pick them up.

Adjournment: The meeting adjourned at 4:29 PM.

Educational Talk: Discussion and talk about building Martha and Dan Cover's pond and their future plans for it -- still a project in progress.

Lynn Riley
Secretary

Featured Articles

To UV or Not To UV

That is the question...

By Ben Plonski Reprinted from AKCA.org

Pond keeping should be enjoyable and relaxing not a frustrating battle with green water. Ultraviolet sterilizers are here to stay. If you are thinking of purchasing a unit you will need to consider the capabilities and the limitations.

U/V sterilizers will keep your water clear of planktonic algae. This means that a new pond does not have to go through the green water stage. If you already have an established pond an ultraviolet system will clear an algae bloom within one to two weeks. The unit will only work, provided it is of good quality and is sized properly for the water volume in your pond and it is properly installed.

U/V sterilizers will not affect the hairy stringy types of filamentous algae that adhere to the walls of the pond. The ultraviolet rays only kill the algae which passes through the unit.

U/V sterilizers will allow a new pond to become established and balanced sooner than without such a device. New ponds need to become established with beneficial bacteria in the biofilter, and a smooth coat of dark algae about 1/4 inch thick on the walls and floor of your pond. These two types of organisms are necessary for a healthy pond. The bacteria and smooth algae are slow growers especially in cold water The planktonic algae on the other hand can bloom in two days. The planktonic algae in full bloom inhibits the bacteria and wall algae by competing for nutrients and blocking out sunlight. This makes the planktonic algae "king of the pond" and can dominate indefinitely. Shallow ponds in full sunlight and overcrowded ponds can be subject to quite lengthy bouts of "pea soup". The ultraviolet rays kill the planktonic algae. By removing the planktonic algae, your pond is able to become balanced more quickly.

Ultraviolet sterilizers will not be very effective at controlling disease within the pond. These units are more capable of controlling disease within a smaller aquarium. To control disease with a ultraviolet system the water must pass through the unit very slowly. Microscopic bacteria and parasites may need a fifteen second exposure time to affect a kill. The planktonic algae is very light sensitive and can be inhibited at much faster flow rates. To effectively control diseases within a large body of water with a ultraviolet unit the entire volume of water must be passed through at a slow rate. The trouble with this method is that the pathogens are reproducing within the pond faster than an ultraviolet system can kill them. An ultraviolet system will not kill any pathogens on the skin of the fish. A very large and expensive system would be required to control disease within a pond.

Good quality ultraviolet sterilizers will be constructed with an external housing made of PVC or other inert material and hued with waterproofed caps. When used outside, a waterproof housing should cover the ballast. The unit like all electrical parts used on your pond should be UL listed.

Ultraviolet rays are in the extremely short wavelength of the light spectrum and can only penetrate a few inches into the water chamber. Ultraviolet units for ponds are only about three inches in diameter The bulb itself needs to function at a certain temperature to produce the peak amount of ultraviolet rays and penetration into the surrounding water area. A quartz sleeve between the water and the bulb, keeps the bulb at the proper temperature and does not interfere with the light penetration.

Proper installation of the unit consists simply of adding a bypass line to an existing pressurized water line from your pond pump or allow better light penetration. Add two PVC tees and a ball valve to your existing line and connect the unit to the assembly. Use the ball valve to control the flow through the unit. Do not exceed the manufacturers suggested flow rate.

Ultraviolet sterilizers have their advantages but are not without limitations. New ponds as well as ponds that have a persistent problem with green water will benefit from a ultraviolet system. Older more established ponds with adequate filtration may not see a noticeable difference. Use ultraviolet systems to complement a good filtration system. A unit will assist in achieving maximum results and appreciation of your pond.

THE TRICKLE DOWN THEORY

If one attempted to create the same surface space in gravel. the filter would measure 100 feet long x 5 feet wide x 4 feet deep.

by James P. Reilly

Reprinted from AKCA.org

The most efficient filtration system today is the trickle or wet/dry filter design. Perhaps the best way to explain this rather bold statement is to study and dissect other systems and identify their weaknesses.

As an approach, I would divide all filtration systems into two groups long term and short term designs. The short term design is one that will work efficiently for a period of time and gradually the performance will begin to fail off. This design is best illustrated by the traditional undergravel in pond filter and the gravel filled chamber filter. In both designs, channeling and anaerobic activity become more and more likely over time. Frequent maintenance can put off real problems, but eventually the low levels of stress created by the fluctuating water quality affect the fish. Low oxygen levels usually go hand-in-hand with this system and it has been demonstrated that only the top few inches of gravel can support aerobic (oxygen loving) bacteria, regardless of the overall media depth.

This short term design can be - and in fact has been improved by the substitution of material in the same traditional design configuration. In this evolution of an old idea, gravel is replaced with open cell foam and/or Japanese matting (actually air conditioning filtering material). This simple substitution of material solved 95% of the problems associated with the old systems. Both water distribution and oxygen levels are greatly improved, but over time these submerged materials can become inefficient as well. As bacteria dies and new bacteria "glues" itself to the substrate, a coating or debris builds up. Algae and diatoms also contribute coating to the original surface. Slowly, this once prime growing surface becomes overwhelmed with decaying materials. Oxygen levels still "test" high, but B.O.D. (biological oxygen demand) levels begin to drop.

To prove this point, I would suggest that the hobbyist look at an accelerated version of this scenario. If you use brushes in your pre-filter take note of the odor that is emitted from your system when doing normal maintenance. If maintenance is done often, no odor is usually detected. This is due to the likelihood that the brushes are performing like a biological filter. When a foul odor is detected, it is likely that the brushes have been overwhelmed by anaerobic bacteria and decay due to excess debris build tip even though oxygen rich water is rushing by and through the brushes. It certainly would be a disaster if these conditions built up in a biological filter chamber right next door! These same conditions can and do build up - given time in open cell foam and mat filters. Odors during this descent may or may not be detected and oxygen levels may only drop modestly. The evidence, however, will be found in lower pH readings, low B.O.D. tests, periodic ammonia spikes (1-2 hours after feeding). excessively high nitrates, fish flashing in early morning only or midday only and/or frequent cloudy water (bacteria blooms). These all can be classic signs of an undersized filter or an overaged short term system crash.

Other examples of short term designs are reverse flow chamber filters, biobrush systems submerged bioball and canister style systems. It is not my intention to destroy people's confidence in these filter media and designs. Most problems with these systems can be corrected with frequent maintenance and regular water changes. I only want to point out the limitations of these designs and - more importantly - identify these systems as "changing" systems that decline in performance over time. All of these systems. when properly maintained, are fine for planted goldfish and shubunkin ponds seasonal koi ponds and moderately stocked nishikigoi ponds.

The group I referred to as long term filter designs would include any system which can remain debris free and oxygen rich indefinitely and employ in its design superior surface space for aerobic bacteria to grow. The three leading designs currently available are the trickle or wet/dry filter, the bead filter and the fluidized bed filter.

To appreciate these filter designs.. we must first understand the problem - how to maintain a large number of koi in a reatively small body of water.

The facts...

- it takes 2.2 grams of oxygen to break down I gram of ammonia
- koi produce lots of ammonia... 35 - 10 inch koi produce 1000 milligrams of ammonia/day

- any trapped debris will decay and reduce O2;
- koi reduce O2 in the water through normal respiration.

The answer... the trickle fitter! The trickle filter is designed to convert ammonia to nitrate by incorporating an oxygen rich environment and a very large surface area for aerobic bacteria to perform. Water enters the top of a trickle filter through a spray bar or drip plate. No debris can pass through the small openings that distribute water evenly over the plastic media. As the water cascades over the media, two events occur. First, this action allows gases, such as carbon dioxide to escape and this aids in keeping pH high. Secondly. by trickling water over the media contact between bacteria and ammonium is maximized. During this process, fresh air is pumped upward through the media column insuring conH stant high oxygen levels in all areas of the media. As a bonus, the falling water has a secondary cleaning and rinsing effect on the plastic media by washing away any hits of debris and dead bacteria into the sump below. The exit to the tower can be hooked to a foam fractionator to remove the foam that naturally builds up from the agitation created by the rising air and falling water meeting at the base of the tower.

Now that a perfect oxygen rich environment has been created, how much surface is there for bacteria to grow on? The size of the living aerobic bacteria colony will adjust to its food supply and O2 level We do not want to restrict surface area in any way since we have enough oxygen and the koi will certainly supply the food.

Each one of my trickle towers holds 1500 sq. feet of surface space per 150 gallons. I use four towers in all for a total surface space of 6000 sq. feet. If one attempted to create the same surface space in gravel, the filter would measure 100 feet long x 5 feet wide x 4 feet deep. In both cases. however, the true action would be less than the trickle tower, because oxygen levels could never be as high or as uniform as in the tower.

My system has been in place for I year and 4 months at the time of this article. The pond is 4,600 gallons and contains 25 show koi ranging in size from 21" to 28". Water quality is good: oxygen levels of 9.2 and pH of 7.4. 1 believe this system matured about S months ago and has remained solid since then. The towers themselves are located in a basement room and, to my surprise, this location has a slight warming effect on the overall winter pond temperature.

I would highly recommend this long term design to anyone wishing to upgrade their present system and I would further recommend a good foam fractionator as the only other device needed to maintain the highest quality environment for our fishy friends.

FOAM FRACTIONATORS
PROTEIN SKIMMERS

Have you noticed foam on top of your pond water? Even though you have a good filter, is your water sort of tea color? These conditions are generally caused by excess dissolved organic solids, a condition that generally cannot be cleared by the filter alone. Water changes will tend to clear the water; however this will most likely be a recurring condition after a short time. One needs to find the cause for these conditions and a way to prevent them in the future.

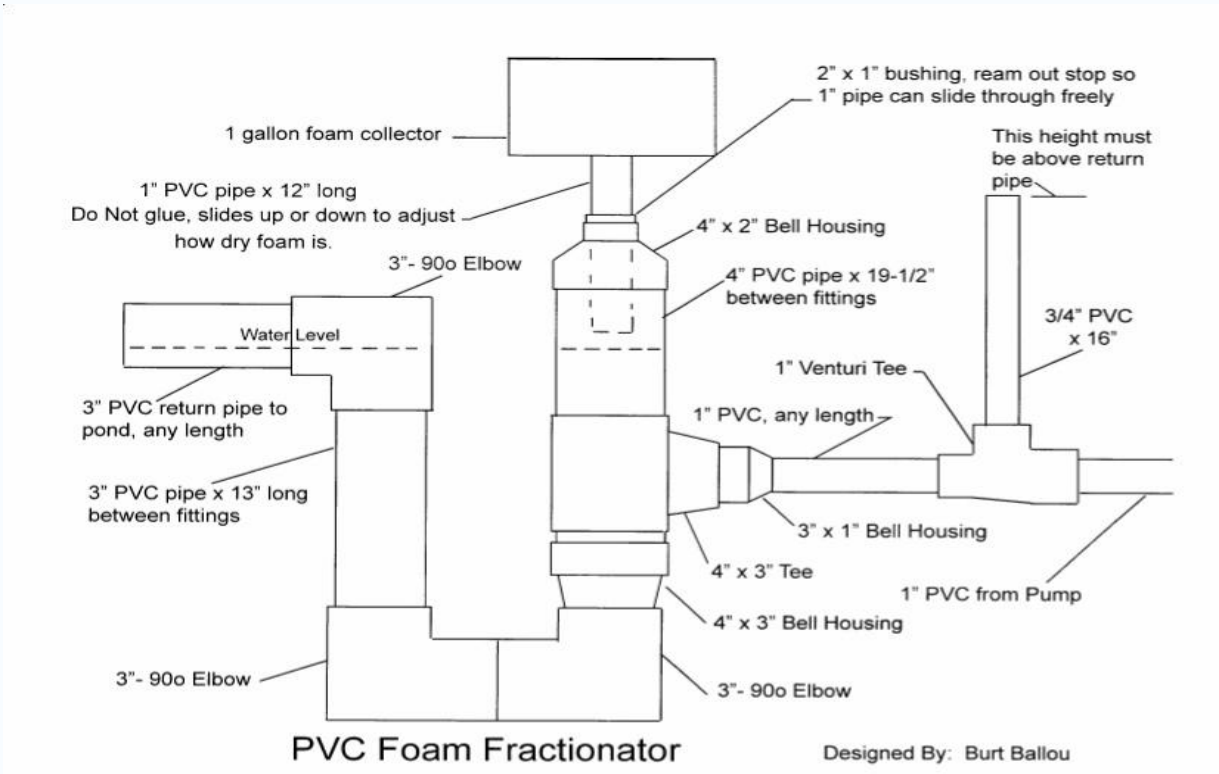
Dissolved organic solids build up through the metabolism of koi and other aquatic organisms, depositing their products of digestion into solution into pond water. Protein levels within the water can also increase rapidly through the inappropriate use of higher protein fish foods. Compounds from uneaten fish food can leach into the water, leading to the formation of foam. Other compounds causing foam include a variety of fats, fatty acids, carbohydrates, metals, detritus, phytoplankton, and trace elements. Spawning activity can cause a foaming pond because of the release of large amounts of protein matter (in the form of eggs and sperm) into the water. All these materials combined, cause an enormous quantity of different organic solids dissolved in the pond water. These dissolved solids when subjected to water agitation, such as waterfalls, result in the formation of foam.

Foam fractionation or protein skimming is a process by which dissolved organic compounds are removed from a liquid by adsorbing them onto the surface of fine bubbles. The bubbles collect proteins and other dissolved substances, and carry them to the top of a device where the foam collects in a cup. Here the foam condenses to a liquid, which can then be easily removed from the system. The material that collects in the cup appears as a pale greenish-yellow liquid. Constant removal of these compounds will help clear pond water and result in better overall water quality.

All foam fractionators have key features in common. For one to function effectively, the following features must be present:

- A large amount of air/water interface must be generated.
- Water containing dissolved organic solids must be allowed to flow through the air/water interface.
- The bubbles must accumulate to form a foam.
- The water in the foam must partially drain without the bubbles popping prematurely.
- The drained foam must be separated from the bulk water and discarded.

Bubble size is the most important of these parameters and is controlled within the design of the protein skimmer. An efficient air diffuser or venturi plays an important part in generating the bubbles that are as small as possible, ensuring maximum surface area for the adsorption of the organic compounds. Smaller bubbles also rise more slowly, allowing more contact time with the process water.



This is a protein skimmer designed by Burt Ballou that can be built by anyone handy with using ABS or PVC pipe. The cost of building this apparatus is less than $100.

The water is pumped through the venturi, in which fine bubbles are introduced, and enters the skimmer body. The input of air from the venturi creates a large volume of oxygen rich water which passes through the main column. The foam and air then rises above the water surface and passes through the 1 inch stand pipe, collecting the foam in a chamber above, which requires either manual emptying or is fitted with a drain to waste. The main water flow then empties back into the pond through the 3 inch return pipe.

When a foam fractionator is first installed, large quantities of foam and greenish-yellow liquid are first formed. Over time, as the DOC concentration drops, so does the rate at which the foam is formed and removed. When run continuously, once it has cleared the residual problem, it should keep the water free from excess dissolved organic solids.

I recently built this model and tried it in one of my ponds. It works great!!!

Don Harrawood,
Koi Health Advisor
Southwest Koi and Pond Association

Bubble Bead Filter

From LSU

By Tom Graham Reprinted from AKCA.org

"Building an effective biomechanical filter is not tough, making one that is easy to maintain was the challenge."

What is the single most important element to a healthy koi pond? Filtration! What often represents the most work in owning a koi pond? Filtration! Where do many pond builders cut comers? Filtration!

It has been said over and over again. The single most important element of koi keeping is water quality, and water quality is a product of good waste treatment. Somehow we must remove the waste products produced in our ponds. I recently had the opportunity to visit Dr. Ron Malone, an Associate Professor in the Department of Civil and Environmental Engineering at Louisiana State University. in Baton Rouge Louisiana. Over the past 12 years, his team of researchers have invested over $750,000 in funding from the Louisiana Sea Grant College Program and the National Coastal Resources Research and Development Institute, studying biological filtration systems.

They have focused on the development of cost effective water treatment approaches for use with high density aquaculH ture production facilities. The result of this effort is a series of head filters ranging from aquarium size to a unit that can handle the largest whale exhibits.

Dr. Malone, who leads the project, spent the day with me and took me step by step through the development and operation of these new filters. He told me that when he began the prqject 12 years ago, they started working with flooded gravel beds, similar to what is used widely in our hobby. As they studied the workings of this type of filter, they saw that the surface area of the media was not efficiently being used, and that the systems were very difficult to clean.

In their research, they studied the entire gamut of filtration media and filter designs. (An interesting story in it's own right). The goal was to find a media that would provide a high specific surface area for biofilm development in a small amount of space (in cubic feet) and to develop a filter design that would be easy to clean and cost effective.

They found that a spherical plastic bead, approximately 1/8in diameter (half the size of a pencil eraser), was the media of choice. The beads they use are made from food grade low density polyethylene plastic and they float. The beads provide a great deal of surface area for bacteria growth - about 400 square feet of surface area for every cubic feet of beads. This compares to around 100 for typical pea gravel, and 125 for bio-balls. And, since they are very durable they never have to be replaced.

They discovered that a floating bead worked particularly well, since the beads would pack into a static bed at the top of a filter chamber, providing the pockets to trap particles and grow bactena, much like an under gravel filter in an aquarium.

Then, when the filter requires cleaning, they turn off the pump and agitate the beads to break free the solids. The solids are then flushed out the bottom of the filter. In their commercial designs, called prop wash systems, they used a large chamber capable of holding 6 to 200 cubic feet of beads. The units are cleaned by a powerful propeller system which intermittently agitates the beads within the filter, shearing off excessive biofloc (loose bacterial colonies) and releasing captured solids. When the propellers are stopped, the beads float to re-form the filtration bed while the solids settle in an internal settling cone forming a thick sludge. The sludge is removed from a drain at the bottom of the cone. Only sludge is removed so the water loss associated with the cleaning process is negligible.

This system has proven to be quite effective in large commercial installations, where very heavy fish loads are being managed. The filters have been tested on systems holding food fish species (such as tilapia, catfish, striped bass, trout) along with a wide variety of specialized applications (including tropical fish, alligators and crayfish).

Once this system was perfected and in use, they switched their efforts to developing smaller, less expensive systems they call bubble bead filters. The new design features an hourglass shaped chamber where air bubbles are used to stir the beads, rather than a motor and prop.

The key element to the bubble bead filter is it's specially designed "washing throat". It is a constriction between the upper and lower chamber, which forces the beads to fluidized (disperse and flow like fluid) as they are gently scrubbed by bubbles which are literally sucked into the filter as the filter is drained. The bubbles move up from the lower chamber, while the water and beads flow down, causing the cleaning turbulence.The cleaning process is designed to remove captured solids without damaging the sensitive biofilms responsible for nitrification, and uses 10 - 15 gallons of water per cubic foot of beads.(A two cubic foot filter will use about 25 gallons).

These smaller systems use from 1 - 3 cubic feet of media, and stand about 4 feet tall. They are constructed entirely out of fiberglass and PVC fittings, with no moving parts whatsoever.

Deciding which system to use is determined by the maximum amount of feed (dry pellets) that is put in the pond on a daily basis. One cubic foot of beads can provide complete solids capture and nitrification for a feeding rate about 1 pound of dry pellets (35 percent protein) per day under production conditions.

For koi ponds, one cubic foot of beads can effectively process one half a pound of feed per day. At a 2 percent (of body weight) feeding rate, a cubic foot of beads will support 25 to 50 fifty pounds of koi food. Commercial food fish production facilities normally support 75 to 100 pounds of fish per cubic foot of beads, but this

demands close daily management of the production system. If you compare that to even the most densely populated koi ponds, you can see these systems are extremely powerful.

Bead filters used to clean koi ponds are typically back- washed once or twice a week during the warm summer months and as little as once a month once feeding drops off in the winter. If filters are not washed they slowly clog, gradually shutting off the return flow to the pond. This decline in return flow is usually visually evident, providing a convenient reminder of the need for backwashing.

Flow rates for bead filters are dependent on the total ammonia-nitrogen excretion rates (TAN) and oxygen demand for the biofilters, which are controlled by the feed rate and pounds of fish in the system. A minimum rate of about 5-10 gallons per minute per 100 pounds of fish (or per 2 pounds of feed per day) is normally used to assure proper bio-filter operation. This means the system only requires a very low flow, low pressure pump, however, higher flow rates may be demanded for large ponds with few fish particularly when a UV light is being used for algae control. This does not present a problem for the filter since performance of the filters improves when the flow rates increase.

The bead filters are effective at removing suspended particles. as small as 10 microns, but cannot harvest the small 5-10 micron algae that often infest a pond. If this is a problem, a U.V. light sized to the ponds volume, (turning over the volume of the pond 4 times a day) will produce the desired results.

Since the small bubble bead systems proved to be well suited for ornamental fish ponds. particularly koi ponds, Dr. Malone engaged the assistance of Burt Nichols, of Water Garden Gems, in Marion Texas. Together they have developed a new model designed specifically for backyard koi ponds.. The system uses 2 cubic feet of media and the bubble cleaning design. Burt is now manufacturing and distributing these filters., which are designed to handle up to a 4000 gallon pond packed with koi. The filter can be seen at his facility, and at Koi Unlimited, in Baltimore. Maryland. The larger prop wash filters are manufacturered by Armant Aquaculture (504)265-9216.

Many thanks to Dr. Malone and his associates, particularly Dr. Kelly A Rusch, Assistant Professor-Research, and Doug Drennan. Research Associate. for spending so much of their valuable time with me answering all my questions, and ferrying me all over Baton Rouge to get this story

Kawarigoi Korner

If you have suggestions for the newsletter or items to be included in Karawagoi Corner or the Calendar, Please contact Brent VanKoevering at 520.780.3980 or bvankoevering@longrealty.com.

Upcoming SAKA Education and Business Meetings

Date	**Location**
May 22, 2011	Noel and Debbie Shaw

June 26, 2011	Sandy and Joe Shiflet
July 24, 2011	Michael and Carol Herndon
August 28, 2011	Curt and Lisa Ogren. Mountain View Koi.
September 25, 2011	
October 23, 2011	
November	No Meeting. See you at the Show.
December	

Shows, Pond Tours and Seminars

Event	**Dates/Location/Links**
November 11-13, 2011	**Annual SAKA Koi Show** **Sam Lena Park**

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Would you like to host a meeting?
_____

Would you like to serve on a committee?

_____ If yes which one?

_____
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