Mountain View Koi, Hereford, AZ, August 28th

3828 E Keeling

Take I-10 East from Tucson
Take exit **302** for **AZ-90** toward **Sierra Vista**
Turn **right** at **S Hwy-90/AZ-90** (signs for **Sierra Vista**)
Continue to follow AZ-90
Continue on **N Garden Ave**
Continue on **Buffalo Soldier Trail**
Turn **right** at **S Hwy-92/S AZ-92**
Turn **right** at **E Keeling Rd** to **3828 E Keeling**

Meeting begins at 12:00, July 28, 2013

Please let Brent know if you are interested in hosting a meeting.

SAKA, Inc Club Officers

President	Bob Panter sakabob@cox.net (520) 747-7278
Vice President	David Young koiman@mindspring.com (520) 403-2949
Secretary	Karen Johnson (520) 400-2073

Treasurer	Dan and Martha Cover mardan79@msn.com (520) 297-4071

Committees/Points of Contact

2013 Pond Tour	
33rd Koi Show Co-Chairperson(s)	Brent VanKoevering bvankoevering@longrealty.com (520) 780-3980
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 koifixer@yahoo.com (520) 400-0335
Membership Chairperson	Faye Hall (520) 297-1253
Education Committee	TBD

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.

SAKA, Inc 10% Discount

With your SAKA, Inc Membership Card at:

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Oasis Tropical Fish
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Patty's Water Plants
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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 or Brent VanKoevering if you are interested in hosting a meeting.

Club Announcements

Business Meeting Minutes

Koi Meeting Minutes June 23, 2013

Call to order by Dave Young
Correspondence: None
Treasurers Report: $13,586.49 Checking
$5,204.20 Savings
CD research wasn't fruitful. Interest is just too low.
AKCA Report: None
Pond tour: None
Koi Show: None
Old Business: Koi Person of the Year : Jim Daunheimer
Pamphlet Display: Most are good. Lows/Home Depot wouldn't display. Company policy.
Dan Cover reported on the Facebook page review.
New Business: None
Koi Show this year will be on the same Veteran's Day weekend, Nov. 8,9, 10
Motion to adjourn, seconded.

Featured Articles

Foamy Water and Stinky Pond

In the spring, several pond owners may find that their pond water is all of a sudden very foamy, the water is discolored, and the pond stinks to high heaven. Most will find that their ammonia level went off the chart. Unaware to the pond owner, their fish could have been spawning.

Koi generally spawn in early spring during the months of March through June; however, they may spawn anytime during the year. Often times occurrences such as a water change, back washing a pressure filter, or a spring rain will initiate a spawn. Most any small change in the pond during this period could spark the spawn.

Prior to the spawning one may notice several koi chasing another koi throughout the pond. The one being chased is a female that is ready to lay her eggs. The chasers are males and occasionally a female will join in the chase. The males will sometimes bump the female and force her against the wall of the pond or against a hard surface in order to induce her to lay her eggs. The spawning process often times gets very violent.

The female will generally find a plant or some other protective area in which to deposit her eggs. When the eggs are deposited, the male koi will spray them with milt, which fertilizes the eggs. These deposits of eggs and milt causes foam on the water surface, a discoloration of the water, and a very strong fishy odor. This process also greatly increases the ammonia level in the pond water. Water changes may be called for if the biological filtration is not adequate enough to dispose of the added ammonia. An immediate testing for ammonia is recommended, since a high concentration of this chemical may result in high stress or death of koi.

Immediately after the spawn, the other koi will start devouring all the eggs that they can find. These eggs are food for them to enjoy. The eggs are covered with a sticky substance and will attach to any solid surface they touch. Eggs that are attached inside plant growth and hidden out of sight of the other koi have a reasonable chance to hatch. Hatch time is determined by water temperature, and generally is about 5 days. After hatching, there is still danger the hatched fry will be eaten by the adult koi. Koi will eat their young until they get a certain size. It is thought that when the fry start getting some color on their bodies, the other koi will no longer bother them. This takes several weeks of survival.

Don Harrawood, SKAPA, Koi Health Advisor

UNDERSTANDING AND MANAGING THE SYNERGISTIC EFFECTS OF STRESS

Ben Plonski Laguna Koi Ponds

" Disease, per se, is not an entity or an end in itself Dis-ease is the end result of an interaction between a noxious stimulus and a biological system, and to understand dis-ease is to understand all aspects of the biology of the species... (Modestly Thomas, 1972)

We all know the excitement of bringing home a new koi . Having searched through so many koi you finally find that special one which tickles your fancy. Floating his transport bag in your pond, the other koi come to say Hi and give him a nudge. You let him into the pond and stand back to admire your beautiful collection of koi. What a sight; all seems well, so you confidently say goodnight. A couple of weeks pass with apparently no trouble and then one day you notice a couple of the koi aren't acting right. Passing it off as "no big deal" you throw in some food and they are mildly interested; hmm, they seem OK, oh well , they'll perk up. Next day, 2 or 3 of them are hanging over by the water fall and a couple more are sitting on the bottom. Prodding your favorite sanke with a net he is obviously in big trouble and a feeling of panic ' sets in. " What could I have done wrong?", you think. " Is the water all right?" You test for ammonia and nitrite and pH, cause that's what your dealer always tells you to do. "They test good ! What else !? It must have been that new koi ! Dad gum it!, that guy sold me a sick fish; now what am I gonna do?"

Unfortunately, this story is not too uncommon. New koi are often a source of infection to the entire pond. The events leading to the dis-ease in your pond are very likely synergistic in effect. When many small stressors combine together, the total effect on the koi is greater than the sum of the effects taken independently. This is why limiting every possible stressor is so important, because they all add up. Fortunately, with a little applied knowledge this serious scenario can be prevented.

Yes koi and goldfish are very strong fish and considered hardy ; but, come on, they can only take so much. Every fish has his limit to handling stress. This is a word we hear a lot..., "stress", sometimes too much. These are some definitions of stress that I took from one of my fish books. " Stress is the sum of all the physiological responses by which an animal tries to maintain or reestablish a normal metabolism in the face of a physical or chemical force (stressor). " (Selye 1950) And " Stress is a state produced by an environmental or other factor (stressor) which extends the adaptive responses of an animal beyond the normal range or which disturbs the normal functioning to such an extent that the chances of survival are significantly reduced." (Brett 1958) Stress is now usually taken to mean the stressor itself, like "temperature stress". Koi have to respond to changes in their world with certain physiological reactions. These corrective adjustments to stressful situations can actually make koi weak. They can only respond to one or two "stressors" at a time and they can't take any more. Their metabolism weakens and their immune system is compromised.

Jet Lag

Consider what a new koi has to go through before he gets to your pond. Let's backtrack a bit, to the koi farm. OK, your sanke gets netted out of his huge mud pond where he has been happily for 4 to 6 months, and undergoes all kinds of handling in the nets and then some hand sorting for quality, gets thrown into cement tanks which are overcrowded and often dirty, medication is dumped on him to keep things in check and he might get a pellet or two for food. Along comes the transhipper or dealer, who must catch him along with other koi in a net again, bag them, transport to his facilities which may or may not be healthy. They go into another crowded vat with a different temperature and some more medicine dumped on them. Foreign koi will then be starved for 7 to 10 days before they are renetted, bagged with maybe 20 or 30 other koi for a long 20 to 30 hour flight overseas. In the bag, the oxygen level falls and carbon dioxide increases; the pH drops and the ammonia level goes through the roof. The dealer picks them up at the airport after inspection by Fish and Game and Customs. Off they go to his shop, where they must adjust again to his temperature and water conditions. While they try to regain their senses, they may be exposed to ammonia or nitrite or pH changes. Often low oxygen levels and lowered temperatures weaken the koi further. Here, they await purchase by you .

Hopefully, the dealer is on top of his water conditions and initiates some preventive medicinal therapy. Hopefully, the dealer monitors his water quality and gives these poor koi a chance to settle down. Know this; koi need at least 2 to 4 weeks of rest and excellent water quality to regain their strength from this traumatic experience, to say the least. Purchase a koi before he has had time to recover and you are asking for trouble.

Adding Insult to Injury

As can be seen from Table 1, environmental stressors and excessive handling really impairs a koi's ability to fight parasites or pathogenic bacteria. The process of netting and handling can bruise and tear the skin which opens sites for infection. Damage to the protective slime and skin barrier probably accounts for more cases of "hole in the side" than we may like to admit. Excessive handling is one of the most harmful of all "stressors" in my opinion. Of course an accumulation of waste products and the accompanying low oxygen and low pH are debilitating. A koi pond is basically a recirculating toilet. Pathogens thrive in these conditions. You must maintain adequate filtration and aeration and make sufficient monthly water changes to reduce waste accumulations.

Water temperature plays an important role in dis-ease response of koi. Koi are not a cold water species; Their immune system functions best with water temperatures approaching 76 degrees F. A lowering of temperature more than 5 degrees in 24 hours can shut down a koi's defense system in no time.

Koi's Adaptive Response

When koi are exposed to any kind of stressor, the adrenal glands release adrenaline and corticosteroid hormones. These hormones initiate the fight or flight reaction and increases cellular energy levels. Unfortunately, these same hormones also depress the activity of the immune system. Furthermore, when koi are subject to stress, their osmoregulatory system is impaired. Osmotic control of internal blood salts and freshwater through the gills is reduced. Internal salts can be lost to the point where the koi's cellular metabolism is threatened and any further immunological response is highly unlikely. Koi may require weeks of recuperation before their natural system is under control again. Thus, any stress, if continued long enough, will reduce the koi's resistance to disease. Parasites or bacteria which are always present will become problematic adding additional stress.

Once a pathogenic invasion occurs, we can expect one of three koi vs. pathogen interactions:

- 1) Pathogen proliferates beyond the control of the koi's defenses and the koi dies. The accumulated stressors were beyond the koi's ability to recover.
- 2) The pathogen persists at an above normal level but no dis-ease is evident; the koi exists as a "carrier". The extent of the environmental stressors was not excessive and the koi's immunity is only mildly compromised. Further stressors during the carrier state will more than likely lead to an increase in pathogens and increase the dis-ease state.
- 3) The koi's immunity remains intact or is acquired and the pathogen is basically "in check" at a very low level which can be considered normal and healthy. The environmental stressors are minimal or non-existent, the koi is strong and the pathogen population is of no concern. But remember, the pathogens are still there.

Potential Pathogen Population

The importance of maintaining excellent water quality becomes evident in regards to these 3 reactions. High water quality with low waste content equals strong koi and a low pathogenic population. Even the inevitable occasional stressor (handling, temperature fluctuation, etc.) can be dealt with by the koi without incidence. Poor water quality with high waste content equals weak koi and a high pathogenic population. Pathogens thrive in dirty pond water, koi do not. Putting it simply, pathogens by their nature, feed on organic material. After all, the koi's skin is organic. A pond with a high waste load will contain a high potential pathogen population.

So yes, stress and poor water quality are the culprits in making koi sick. We have seen that stress is an accumulative thing. Koi can deal with a mild stressor here and there, but when the stressor is continuous or multiple, the koi cannot adjust. What follows the stress is the onslaught of endemic parasites and pathogenic bacteria to a weakened koi. Parasites and pathogenic bacteria are a part of life. They are always present. We cannot eliminate them. What we can do is learn to live with them in a healthy manner. Knowing this as a fact we can plan ahead to provide conditions which increase the koi's strength. Fish have had to deal with these pathogens before mankind existed. Some how we can accept the fact that our dogs and cats get fleas and ticks or our roses get aphids. Well, koi also have parasites and pathogenic bacteria, period.

The Koi In The Plastic Bubble

Please consider this carefully for existing populations of koi. Koi which have been established in a pond for years I call, " The koi in the plastic bubble". Remember that movie about the boy who did not have any immunity to the diseases of the outside world and had to be confined to his house? Well, old established koi populations are the same way. They become very healthy and resistant to the pathogens in their little world. They are stable and can resist mild stressors without any problem of infections. Their filter is totally gross and is rarely cleaned. No problem! You say you haven't changed the water in how long? No problem! They were originally 20 small koi and now they are 20 very large koi. No problem! With confidence you go down and buy a new koi on sale and BOOM. You got problems! Indeed, this situation is one of the often overlooked potentials for disaster. Isolated populations of koi simply cannot respond immunologically to new "bugs". Likewise, a new koi cannot take the additional stress of being introduced to a dirty, poorly managed pond. Of course, a very clean and well managed koi pond will be less adversely affected than a dirty overcrowded one. The koi will have a fighting chance. Usually, koi afflicted with this problem will be lying down on the bottom of the pond. Often the new koi are just fine, it's the older ones which become sick: The best cure for this problem is a very high salt solution in the pond at 0.5% to 0.7% for 3 to 5 weeks. In addition to the salt, treat pond with formalin/malachite green every 3 to 4 days for 2 weeks. Furthermore, we must consider the past history of our existing population of koi. Do not add new koi to an existing population that has just recovered from some infection or water quality problem. Give the existing population time to stabilize, at least one month. Also, I think it is a good idea to wait at least one month between additions of new koi, to perpetuate stability. There is a saying in aquatic animal husbandry, " Nothing good ever happens fast". So, apply a dose of patience sometimes.

To The Rescue

You might have a healthy pond, but your new koi is weak. Newly purchased koi are faced with many "stressors". The degree of stress will determine whether they can adapt and recover. So we must provide some kind of aid to help him and the established koi to adjust and settle down so that their own immune system can become strong and protect them. Our main objective is that: All our actions or medications should be aimed at producing a strong koi. Usually all we are concerned with is killing the pathogens with little regard to the natural environment of the pond or on the koi's skin. This sets us up for worse problems down the road. Certainly, we can control these pathogens with proper knowledge and preventive techniques and above all, a workable filtration system.

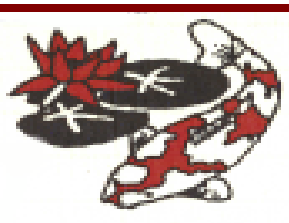
Water Quality and Filtration

Check your water chemistry; check your filter. A dirty filter loaded with sludge is one of the main breeding grounds for pathogens. Biofilters produce a sticky sludgy slime and will become increasingly anaerobic even with a good prefilter. Anaerobic areas in a biofilter actually contribute to bacterial infections. Furthermore, we are growing a tremendous amount of bacteria in a bio filter, and the question arises, " Just how much bacteria do we really need?" We are growing good bacteria and pathogenic bacteria in our filters. This is just how mother nature works with her natural checks and balances. The bacteria keep growing and the bacterial count in the water and filter can become excessive. A filter which clogs easily and restricts flow will surely require more diligent cleaning to

ensure that a healthy population of good bacteria are present. Some of the newer filtration designs promote easy cleaning with a resultant lower pathogen count. I want to make a comment on our filter designs of the past. Originally all we were concerned with was having clear water and no ammonia or nitrite. A compacted type of filter material like gravel or foam did this job for us and we were happy. Of course we thought everything was working and simply chose to forget about cleaning the filter. Then, problems eventually arose due to the compacting and channeling nature of these materials so we vigorously cleaned the filter and our water turned green. We tested for ammonia and it reads zero. So we attached an ultraviolet sterilizer and again all seemed well so we neglected the filter again. Hey, as long, as the water is clear and the fish seem OK we should leave well enough alone; right? Now it has become evident that all is not well with a neglected filter. We were all told that a biofilter can compete with pea soup algae and keep our water clear without a UN. A bacterial filter does two things. First, the process of mineralization which breaks down organics by the action of heterotrophic bacteria into inorganic ammonia. Secondly, the process of nitrification which converts the ammonia by the action of autotrophic bacteria into nitrite and nitrate. An important fact to remember is that organic type bacteria compete for space with the nitrifying bacteria. Yes, we do need both types of bacteria to have a well conditioned filter. However, the organic type bacteria usually outweigh the nitrifiers immensely. Ammonia build up in an established pond is often a result of a filter overloaded with organics being converted to ammonia. The filter plugs up and less actual filter surface area is being used. The bacteria which digests organic matter has the potential to clear a pond of green water. However, the filter can only digest so much before it plugs up. A thorough cleaning can wash away the bacteria and enzymes which "eat" green water. So, we are stuck between cleaning the filter too much and not enough. This becomes an extra job when our filters are too small.

When we rely on the biofilter to digest the organic filth and control green water, we are creating a time bomb of a bacterial explosion. Pathogenic bacteria are of the same varieties which digest organic waste. Naturally, the greater the organic waste in the filter, the greater the number of pathogenic varieties. In this day and age of understanding we are much better off using an ultraviolet sterilizer to control pea soup and use a loose fill type filter material to control ammonia and small quantities of organic waste. The vast majority of solids should be washed away frequently and water changes increased to reduce dissolved organic and inorganic substances. Simple. No fancy equipment, no fancy chemicals. This is not to say that gravel or foam filters are no good. They just need more frequent and vigorous cleaning to relieve the pond of excess bacteria and waste. Some of the inherent problems of a compacted type of filter material can be cured by simply increasing the flow of water through it to increase usable surface area and oxygen.

2012 SAKA Koi Show Vendors



Mountain View Koi Fish
3828 Keeling Rd
Hereford, AZ 85615
520-3678-1271

Kawarigoi Korner

SAKA has the Emergency Supply Stations - Praziquantel, Dimilin, Potassium Permanganate, Sodium Thiosulfate, ProForm C. Parasites begin to revive from the cold much sooner than the Koi. The Koi's immune system is at its weakest right now and until the water temperatures hit 60F. Watch your fish for signs of distress. Do not start feeding until the water is above 55F and will continue to increase in temperature, at this point feed a wheat germ feed or Cheerios.

Click Here to see new items for sale on the SAKA Website.

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
July 28	Curt and Lisa Ogren. Mountain View Koi
August 25	Michael and Carol Herndon
September 22	John and LaDoris Goudy
October 27	
November	No Meeting. See you at the show
December	

Shows, Pond Tours and Seminars

Event	Dates/Location/Links

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Today's Date: _____

# of Koi _____

Years Keeping Koi: _____

Pond size: _____

Would you like to host a meeting?
_____

Would you like to serve on a committee?

_____ If yes which one?

_____

Make Checks payable to: SAKA, Inc.

Mail to: Martha and Dan Cover
2841 W. Puccini Place
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