

## SAKA NEWS



### President Corner

Spring has sprung, fall has fell, summer is still here and its' still hotter than h---. Would someone please put fall back in its place?

October takes us to the Pond of Faye and Winton Hall for another beautiful aquatic arena of Koi delights. Thanks in advance for sharing your pond with us. The nights are getting longer and the days shorter. This must mean that your water temperature is starting to cool off. If you need to get into your pond, you better do it soon. It might already be too late. Burr Berry. Our 26th Annual Koi Show and Fish Auction is just around the corner. What are you going to help out with? As always we can use all the help we can get. We need help all three days. Friday to set up, Saturday for Show tanks, evening guard duty, and Sunday take down. Take down. Take down! Only after our fish Auction. You are the best in the west. So help where you can. Don't forget meet the judges Friday night and our Famous Koi Banquet Saturday at the El Parador on Broadway. Well our October meeting is upon us hope to see all of your there. Have a Happy Halloween.

For the love of Koi,  
*Bob Panter*  
Bob Panter  
President SAKA

### 26th Annual Koi Show

Southern Arizona Koi Association  
FREE ADMISSION

**Raffle**  
Win a color TV

**Auction**  
Sunday noon

**Vendor Fair**  
Saturday 9-4 & Sunday 9-1

**November 12th & 13th, 2005**

Kino Veterans Memorial Center  
2805 East Ajo Way  
Tucson, AZ  
Across from Kino Hospital



Information  
www.sakoinc.org  
koinman@saol.com  
azakboy@msn.com

## **HELP NEEDED:** *We desperately need help. Please sign up*

Show registration forms and fees mailed and postmarked before Nov 1 will be \$25.00; after Nov 1 \$45.00. **All pre registered & paid entrants will be assured of one tank.** Second and third tanks will be sold based upon postmark, after all pre registered entrants have one tank. We will give you one week's notice of confirmation of additional tank requests. **There is no guarantee of a tank if you do not pre register!!!!**

### *Committees*

**Auction** Sunday Noon: Dennis Leonard. There will be another auction in May on the Pond Tour. Please let Denny know in advance if you intend on bringing fish to the auction

**Raffle:** Kathy Leonard and Noel Shaw. Please help them by canvassing donations from your employer and businesses that you support. Buy raffle tickets and sell to your friends.

**Registration:** Debby Young – See your last newsletter for the registration forms for fish entry and Friday & Saturday dinners. **Due by Nov 1st**

**Advertising:** Debbie Shaw – Small posters are ready now.

Many volunteers are needed to run a successful Koi Show. Please consider giving 4 hours of your time. A list of tasks and time schedules will be given out at each meeting until the show – please sign up voluntarily or Debby will be calling you and harassing you!!!

**Earn Credits by working  
Friday Set Up and/or  
Sunday Tear Down**

**October 2005**

**Friday set up – 8AM to  
noon = 5 credits  
(MAX 10 PEOPLE)**

**Friday set up – noon to 4  
pm = 5 credits  
(MAX 12 PEOPLE)**

**Sunday tear down – 3pm  
to 7 pm = 15 credits  
(MAX 18 PEOPLE)**

## **Show Vendors**

**Mountain View Koi  
Fish & Aquatic Plants**

**Aquatic Odyssey**

**Southern Arizona  
Bonsai**

**Pre Load  
Party**

November 5, 2005  
9:00am  
Rancho Del Koi  
(Load them tanks)

Or

Doug Wahl house  
Call 682-7697 to work  
Doug's place

## SAKA NEWS

# Current List of Raffle Prizes

**Reid Park Zoo**  
Family Day Pass

**Oase Pumps**  
www.oase-pumpen.com  
Filtoclear 800/9wt.UV

**Tucson Botanical Gardens**  
4-Admission Passes

**Koi Care Kennel**  
www.koicarekennel.com  
Debride Medicated Koi Food

**Cal Pump**  
www.calpump.com  
1500GPH Torpedo pump

**Zeigler Bros. Inc.**  
Koi Food

**Performance Pro Pump**  
www.performancepropumps.com  
100.00 Gift Certificate

**Funtasticks**  
www.Funtasticks.com  
Family Golf Pass

**Calif. Earth Minerals**  
www.terrapond.com  
TerraPond Clay

**Aqua Ultraviolet**  
www.aquaultraviolet.com  
Advantage UV Light

**Danner Mfg.**  
www.pondmaster.com  
pump, filter and Koi Food

**Ecological Labs**  
www.microbelift.com  
Microbelift & Koi Food

**ABI, INC.**  
Ultra Clear  
www.ultraclear.com  
Ultraclear Pond products

**AquaScape Lifestyle**  
[www.aquascapedesigns.com](http://www.aquascapedesigns.com)  
magazine sub.; pond books, Koi food,  
plant fertilizer

**Aquarium Pharmaceuticals, Inc**  
Koi Food, Pond Chemicals  
www.pondcare.com

**Novalek/ Kordon**  
Pond Prep

**Boatcycle**  
www.boatcycle.com  
net, aerator

**Green & Hagstrom Inc.**  
www.highlandrimaquatics.com  
Plant Fertilizer

**Boyd Enterprises**  
Super Koi Life Food

**Pentair Aquatics**  
www.pentairaquatics.com  
Trio pond filter/pump kit, Test kit

**AZ Ponds**  
www.azponds.com

**Pondmaster chemicals**  
Pond Supplies

## The Judges Head Judge



Name: Galen Hansen  
Address: 11230 Rolling Hills Drive  
Phone/Fax: (619) 440-3930  
e-mail: Galenkoi@aol.com and  
Galenkoi@cox.net  
Profession: Obstetrician, Gynecologist

Size of Pond: 13,000 gallons

## October 2005

Year Certified as Judge: 1994  
(Assigned as part of committee of 3)

Years in Hobby: 1981

Affiliated Club and how many years:  
Koi Club of San Diego (Founder)  
1984 ZNA So Cal 1984

Positions held in club: President of  
Koi Club of San Diego: 1984, 1985,  
1986, 1990, 1991, and 1995. Show  
Chairman: 1987, 1995, 1996, 2000,  
2001, 2002, 2003, 2004. Original  
Newsletter Editor. AKCA Rep for  
about 10 years. On Executive Board  
from inception of club

Other Koi related Activities: ZNA  
Certified Judge since early 1990's.  
Science Editor KoiUSA since about  
1990. Written articles for KoiUSA for  
about 15 years. Speaker throughout  
the US on Koi Health, Koi Selection  
and Judging, Pond Construction and  
Filters, and all aspects of the Koi  
hobby. Wrote By-Laws for AKCA  
Judging Program. Organized all of the  
9 years of the AKCA Judging  
Seminar. Attended most of the ZNA  
Judging Seminars in the US

Accomplishments: Most proud  
accomplishment, Pioneered the much  
neglected subject of Koi Health, both  
in disseminating information as well  
as achieving the involvement finally  
of some DVM's in the Koi hobby.  
Showed my Koi in 88 Koi shows  
winning over 1300 prizes. Being  
available for everyone in the hobby  
for Koi health issues. Spearheading  
the concept of putting a Koi pond in  
the Japanese Garden in Balboa Park in  
San Diego. First Koi Person of the  
year in Koi Club of San Diego.  
Organizing first AKCA Seminar  
outside of LA in 1990. Starting and  
continuing the Koi Judging segment in  
Koi USA. Judged in: Japan, Australia



# Assistant Judge



Name: Charles (Chuck) Poppe  
Address: 4502 Carlby Lane,  
Alexandria, VA 22309 Phone/Fax:  
703-360-5918/ 703-780-1957  
e-mail: marine.koi@erols.com  
Profession: USMC Retired

Size of Pond: Three ponds, 500, 5000  
and 8500 gallons.

Year Certified as Judge: Certified as  
an AKCA Judge in 1995 and a ZNA  
Judge in 1996.

Years in Hobby: Became involved  
with Koi in 1982.

Affiliated Club and how many years:  
MAKC, 1986 to 2000, ZNA Potomac,  
1991 to present, ZNA Lone Star, 1996  
to present.

Positions held in club: Co-treasurer,  
MAKC, President, ZNA Potomac,  
AKCA Rep., ZNA Potomac, Show  
Chairman, and ZNA Potomac.

Other Koi related Activities: Have  
written articles on several Koi related  
subjects, Talked at Show seminars,  
visited Japan twice since becoming a  
Koi person.

Accomplishments: Doris and I have  
won two Grand Champion awards for  
Koi we purchased as two year olds  
and raised here. We have shared Koi  
Person of the Year and have attended  
all AKCA seminars except one since  
1986. Judged in Australia as a head  
judge in 2002.

# Assistant Judge



Lester Berkow  
6534 Via Rosa  
Boca Raton, FL 33433  
(407) 392-2190

# Assistant Judge



Name: Robert (Bob) I. Brudd  
Address: 7920 Laguna Lane Orland  
Park, IL 60462  
Phone/Fax: 708-460-9202/708-460-  
9207  
e-mail: r.brudd@comcast.net  
Profession: retired English teacher,  
quasi-active professional fine art  
photographer

Size of Pond: 13,000 gallons with two  
vortex systems containing Answers, 3  
Aqua UV, Ultima II filters, and an  
AES bio-reactor

Year Certified 2005

Years in Hobby: Since 1993

Affiliated Club and how many years:  
Northern Midwest Zen Nippon  
Airinkai Koi Club As co-founder,  
since its inception in 1998

Positions held in club: I started out in  
the Midwest Pond and Koi Society  
where I was 3 time Koi show  
chairman, board member and vice-  
president. I've been co-chairman of  
Northern Midwest since its inception  
and 2 time trade show chairman.

Other Koi related Activities: I have  
been published in Koi Carp Magazine,  
Nichirin Magazine, Koi USA and  
numerous club publications. I have  
traveled to Japan on five occasions,  
once to see the gardens and temples of  
Kyoto and four times to see Koi,  
including three All Japan Shows. I  
have attended at least six ZNA  
judging seminars and served as a  
volunteer at numerous Koi shows.  
Finally, I've been a speaker at three  
AKCA seminars, was recently invited  
to be a presenter at the 2004 seminar  
in Hawaii, and have spoken at several  
Koi clubs.

Accomplishments: Grand Champion  
has eluded me, but I've won Reserve  
three times and been chosen Koi  
Person of the Year by both the  
Midwest Pond and Koi Society and  
the Northern Midwest ZNA Koi Club



## WHY SHOW YOUR FISH?

By Ray Jordan

I believe there are four main reasons.  
■ The enjoyment of sharing your pets  
with other fish lovers: It is a really  
wonderful feeling when you hear  
other fish lovers admiring your pet  
Koi or goldfish.

■ The satisfaction of knowing your pets are getting the best possible care: First and foremost fish are judged on their overall growth and health. Their size, shape, and quality of color are determined mostly by your care and pond water quality. If your fish are not growing or developing as they should a show is a good way to find out and then gives you a opportunity to improve their living conditions.

■ The opportunity to see and study the best: The chance to learn from other fish/owners what is the ideal shape, color, patterns, etc. Ask other owners for advice and help and learn how to select and grow better and healthier Koi & goldfish in the future. Better fish do not cost that much more if purchased when small.

■ There is a thrill of competition vs being a spectator: Let's face it is fun to watch a tennis or golf match but it can be much more fun to be a part of the competition.

So why don't more members bring their fish to our show

A few of the most common concerns I hear expressed are as follows:

■ I don't want to harm/stress my fish: And I can assure you neither does anyone else. I would never take my fish to a show if I experienced significant problems. The #1 priority at our show is fish safety. We have spent a lot of extra money to help insure the health of our pets. We have specially designed tanks with a unique flow through water system for Koi and over 40 - 20 gallon aquariums for goldfish. With the Koi tanks we run enough water through each tank to completely change the water four times a day. We also shelter the fish and ourselves from the elements and block out direct sunlight. Every fish is very carefully inspected for any problem before being admitted to the show. Also fish are carefully monitored and water is tested regularly and changed if necessary. All fish handlers are trained to handle fish with minimum stress and as much as possible eliminate possible injury. Remember my fish are in the show also so I am

committed to keep fish safety our #1 priority.

■ I do not feel comfortable catching my fish and transporting them safely. We all needed some helpful hints the 1st time we took fish to a show. But also realize there will come a time when you need to be able to catch a fish to move it while cleaning your pond or to treat a small problem before it becomes a big one. So you must be able to catch and safely transport fish to be a responsible owner whether or not you take your fish to a show. (Check out the article after this one how to transport your fish to the show.).

■ I am concerned my fish will catch a disease or parasite at the show. We currently use what is called the English Style method of showing fish. Each owners fish are kept separately from all other fish in their own tank/s. Separate tubs and nets are used exclusively for a single owners fish to keep from exposing water from one tank to another. Fish handlers and judges wash their hands and equipment in disinfectant to prevent moving anything from one tank to another. Most fish capable of transmitting a problem will show some sign of their infection. Some of these signs could be sores, bloody or ragged fins, excessive slime production, and redness around the mouth or vent, difficulty in swimming or maintaining their balance in the water, flashing or visible parasites. These "suspect" fish will be prevented from entering the show. Also, healthy fish in water above 75 degrees have a strong immune system capable of resisting most infections. Our best prevention is to keep sick fish out of the show. So we will err on the right side of this issue. In other words, if in doubt we will not allow a suspicious fish into the show to protect everyone's fish. Additionally, "bad" critters live in everyone's pond. It is the amount of these "bad" guys and the health of your fish and pond/filter system that determines your problems or lack of problems. All this said fish shows are not perfect isolation

situations it is inevitable that some water will be mixed between tanks accidentally or by the fish jumping and splashing.

■ I do not have expensive or large enough fish. Most fish entered in our show were relatively inexpensive when purchased (Koi @ \$100 or less, goldfish @ \$20 or less). Fish are judged first on conformation (shape), then color, and then pattern (genetics). How well you care for your fish is the biggest determination of their quality. Koi are judged by size and small Koi are judged against other small Koi, so size is not an issue. Also consider, three years ago the Grand Champion Koi was purchased locally (several years earlier) for \$50 when it was six inches long. It was then lovingly and carefully grown by its owner before winning the top award. A \$5 fish will not likely win a top award but we have awards for "Most Unique" and other ways to reward good fish that have been well cared for. You just might be surprised how well your babies could do if given a chance.

■ Alternative: Another idea for 1st timers might be to buy a Koi or goldfish at the show from one of the fish vendors on Friday afternoon or Saturday morning before 9:30am when the fish registration is completed. This way you do not have to catch or transport your fish from home but you could still win an award and be a participant. In fact, we have had fish purchased from a vendor, entered in the show, win best in size, and then be donated to our fish auction after the show. (The owner kept the trophy) This is a way to participate with a minimum of hassle and also help the club pay for our annual show expenses.

■ I hope this article may have generated some new consideration in bringing your fish to the show. If this will be your 1st time you might want to bring just a few to make it easier. Remember how much more fun you have had in the past being a participant in an event vs just an observer. SEE YOU AT THE SHOW!

# **KOI**

## **TRANSPORTATION**

(HOW TO MOVE KOI FROM HERE TO THERE)

By Gene Ewy MD

### **KOI ISOLATION AND HANDLING**

When a Koi hobbyist wishes to closely inspect or move Koi from a Koi pond, the specific Koi must be isolated and guided into a suitable container. A good quality Koi net with knotless fine mesh and the circular frame totally covered is recommended to minimize the risk of damage to the Koi. The bay depth should be shallow. The Koi net should be a large as possible (depending on the size of the Koi) though larger nets are more difficult to move through the pond water, particularly if the net has a telescopic handle and it is extended.

Take it easy. Don't get the Koi or yourself agitated. Don't agitate or stress the remaining Koi. Its risky to approach the Koi from its tail since the caudal fin may be damaged as the Koi responds vigorously to the net touching its tail. Minimize net contact with the Koi. Ideally approach the Koi from the front getting the net under its head and gently guiding it into a floating tank or tub.

One advantage of the Koi net is that a single person can guide the Koi into a floating tank. The rim of a large Koi net (guiding a Koi to the floating tank) is used to submerge an end of the floating tank. The Koi is then guided into the floating tank. This maneuver is easier if a second person appropriately submerges the tub or floating tank. A single individual can also bring the Koi in the net adjacent to a floating tank or tub. The net is controlled with one hand which has been advanced on the pole to a position near the net. The floating tank or tub is submerged with the other hand and the Koi is gently guided into the container. Don't lift Koi from the water with the Koi net, particularly.

Koi can be collected from a smaller pond readily in the manner described with a Koi net. A telescopic pole will allow the net to isolate Koi in a larger pond. If this is not practical consider PTTN - patience, time and two nets. The second Koi net handler gently guides the selected Koi into the Koi net of the primary handler who guides the Koi into the tub or floating tank.

If your pond doesn't lend itself to any of the above methods, a seine may be used to partition the pond into areas from which the Koi may be collected. The mesh of the seine should be knotless. The seine should be longer than the width of your pond. The width of the seine should be greater than the depth of the pond. The seine should have floats at or top and weights on the bottom. Koi are not lifted with the seine.

### **KOI HANDLING - SHORT DISTANCE MOVES**

The Koi that have been isolated and guided into

a container are ready to be moved. This can be accomplished in a number of ways. If the Koi is in a tub in the pond with enough water in the tub to cover the Koi the tub containing the Koi can be Ned from the pond. The tub or any other container in which a Koi is being carried should be covered. A mesh cover, a solid cover or plastic begs on the surface of the water can be used. The container with Koi can be carried by hand, placed on a cart and wheeled or the container itself may be on wheels. The Koi should be transferred promptly to the destination water (isolation tank, show tank, etc.).

Koi sock nets we open ended fine mesh nets attached to a circular covered frame with a relatively short handle. The net is much longer than the diameter of the opening (42 inch sock net with a 10 inch diameter opening as an example). The Koi is brought through the opening of the net head first by carefully advancing the net over the head of the Koi or by manipulating the head of the Koi into the net with your free hand. The Koi is positioned in the body of the net, the end of the net is closed by one hand of the holder, the other end of the net is folded over to retain the Koi the hands are held tautly apart as the Koi is lifted from the water and transferred hopefully for only a -short distance. A head first exit of the Koi from the sock net is preferred to avoid unlikely but perhaps possible fin or scale damage. Some mucus may be lost from the skin. This a safe method to move Koi short distances.

I prefer to use plastic bags for most short distance moves. Double plastic begs (one bag inside another) should be considered particularly for larger Koi for safety. Three mil and four mil bags are quite strong. Bag size depends upon the size of the Koi. Fish should be carried horizontally. Small fish may be carried in the small end of the plastic bag with the bag held upright; large Koi may need be carried with the bag horizontal and held tautly between both hands. The largest Koi may need to be carried by two handlers.

The top edge of the plastic bags should be rolled over. This results in a large relatively fixed orifice which frees one hand that can be used to direct the Koi head first into the bag. Some pond water should be in the bag when the Koi is gently introduced. There should be enough water in the bag to cover the gills of the Koi as the bag is carried to its destination. A head first exit from the bag is ideal but I think the smooth plastic surface allows a tail first exit with negligible risk if done carefully. If the opening into the bag is large enough the Koi can be lifted out by hand. For a short move without adding transfer water to the destination tank consider transferring in a plastic bag with a comer cut out to drain the water.

I have noted from a UK publication (Koi Health Quarterly) an instance of a tom plastic bag from the dorsal fin of a Koi. From both a UK publication (Koi Kichi) and a Japanese publication (Rinko) recommendations are made to remove a palpable 'hook' on anal fins of large Koi which might tear a plastic bag. If this could

happen it would be an added reason to double or triple bag large Koi.

Moving Koi by hand is best reserved to transfer Koi from one container to an immediately adjacent container. Koi have a slick slime coat, they may be quite active and they can be dropped. Dropping Koi is not recommended. The handler's hands should be thoroughly wet. No hand jewelry should be worn. The Koi may resist movement in a direction it is not going and become agitated.

If it is difficult to place your hands under a larger Koi in the proper position for support of the Koi during transfer, consider taking advantage of temporary disorientation produced in the Koi when rotated in a clockwise or counterclockwise direction for a few turns. If going clockwise the handler should place his right hand across the left head and shoulder area and support the under surface of the Koi just back of the head with his right hand when the Koi is facing at eleven or twelve o'clock. Continue the clockwise rotation with the right hand; place the left hand under the posterior aspect of the Koi when the head is at four to six o'clock. Lift the Koi from the water. Bring the head close to your body for control, move your hands with the Koi if it moves as you deliberately and promptly transfer the Koi to the immediately adjacent container.

### **PREPARING KOI FOR TRANSPORTATION**

Stress during Koi transportation should be minimized as much as possible. Stress may lessen the effectiveness of the koi's immune system. The possibility of infection or other health problems which could be transmitted to other koi in your pond is enhanced.

Koi should not be fed for at least three days and possibly seven days before transport. The production of ammonia during transport is reduced and the transport water is not polluted to the extent that it would be had the Koi been fed during this fasting period. Koi may be eating algae from the pond wall during the period when they are not fed.

If an isolation tank with adequate water volume and an active biological filter is available the Koi could be in this tank at least during the last part of the fasting period. Additives to the isolation tank water could be salt, mineral salt or various medications. Be accurate. Do not over medicate. There will be less stress when the Koi is in a dark environment during transport. Transport water can be cooled to reduce metabolism. Mild sedation could be considered.

### **LONG DISTANCE TRANSPORT**

In general Koi may be transported for long distances and many hours safely in plastic bags or in rigid containers, the development of the plastic bag had an immense impact allowing safe worldwide Koi transportation.

### **TRANSPORTING KOI IN PLASTIC BAGS**

It's time to get physical again. We're going to put our Koi in plastic bags for transport. There is a wide choice in bag size and thickness. The

bag should be longer than the rectangular corrugated cardboard Koi box or any other container into which the bag will be placed. This allows secure closure of the bag using most of the length of the box.

Double plastic bags should be used putting one bag inside the other. Large Koi transported long distances by airplane within the USA or from overseas may be within the inner bag of 3 to 5 bags. It is helpful to roll the mouth of the bag down before placing Koi in the plastic bag. This produces a relatively fixed opening and keeps water from going between the bags. Put some water from the pond or water prepared specifically for the transport into the bag.

The Koi is put into the bag by hand transfer or by using your free hand to direct the Koi into the bag. Usually only one Koi 18 to 20 inches in length is placed in a bag, perhaps two 15 to 18 inch Koi are placed in the saw size bag, etc. The gills should be covered with water, I prefer to add enough water so that the Koi can float, not rest on the bottom of the box.

Some hobbyists and dealers put additives in the transport water. This includes such things as salt, mineral salt, antiparasitic medication, antibacterial medication, etc. If you choose to do so, do not overdose. Prepare the transport water accurately and add it to the bag. Transfer the fish into the bag by hand, sock net, or bag with a corner cut out to drain the pond water from the bag so that minimal pond water will be added to the transport water. The transport water will not be significantly diluted. The bagged Koi is placed in a corrugated rectangular Koi box, styrofoam box, polystyrene box, ice chest, etc. The length of the box is usually about two times the width or height. The width and height are normally similar. Newspapers are often placed in the bottom the Koi box primarily for insulation. I won't say that Japanese newspapers are best but the Koi I have received directly from Japan have been calm and happy.

Look closely at the bagged Koi in the transportation box. If water needs to be added or removed, do so. Remove all air from the bag by carefully compressing the bag down to the water level. Pleat the plastic bag near the mouth of the bag so no air reenters the bag. Insert the hose from the regulator (attached to an oxygen cylinder) through the mouth of the bag. Slowly fill the bag with pure oxygen to about three fourths full and withdraw the hose. Twist the neck of the bag so no oxygen escapes. Fold the neck of the inner bag over and secure it with rubber bands tightly placed over the folded neck. Use two rubber bands for safety. Seal the outer bags in sequence in the same manner. Insulating material (usually newspapers) is placed over the bag in the box and the box is sealed.

If one wishes to gradually lower the water temperature in the bag during transit, place frozen reusable freeze packs on top of the bag before adding newspaper insulation. Support the bottom of the cardboard box when it is being carried.

Place the transport box or other container holding the bagged Koi in the transport vehicle sideways to the travel direction Braking during transit would then move larger Koi sideways and would not bang their nose against the end of the box. The risk of injury is reduced. The transport box must be secured so it does not move during transit.

## MOVING KOI IN TRANSPORT TANKS

The other method of moving Koi long distances is in transport tanks. Many varieties of tanks are used: 1) flexible liners such as vinyl coated industrial fabric liners in a rigid frame made from PVC, tubular steel or other material, 2) polyurethane tanks, 3) fiberglass tanks, etc. The tank must have a secure cover to retain water and Koi. The zippered covers with vinyl tanks allow easy closure and easy access. The size of the tank is determined by the type of vehicle and the amount of weight that can be carried safely in the vehicle. Water weighs over eight pounds per gallon. There are seven and a half gallons in a cubic square foot of water. My transport tank for a station wagon measures 3 foot by 4 foot and is just over 19 inches high. Usually we carry 10 inches of water which is 75 gallons weighing 625 pounds. Obviously transport tanks in trucks can be much larger, carrying more water and fish. All tanks must be stabilized so they will not shift during transport. The transport tank water should be oxygenated before Koi are added and the dissolved oxygen in the water should be maintained at about 9 parts per million or over. Pure oxygen can be diffused into the water easily using an oxygen tank with a regulator through an air stone or a fine-pore diffuser for pure oxygen. The advantage of a fine-pore oxygen diffuser would be a smaller bubble size (approximately 0.5 to 2 mm diameter) which would increase the total surface area per unit of oxygen. Oxygen saturation is maintained with a slow flow rate. This system is used world wide with great success.

Air, which is 21% oxygen, can be introduced into the water through an air stone (approximately 1 to 3 mm diameter bubble size). The flow rate would have to be significantly higher than the flow rate of pure oxygen to maintain the same oxygen level in the water. The source of the air could be from a 12 volt portable piston or diaphragm compressor operating from the car or truck battery during transit. An adapter from the cigarette lighter socket is used. If the tank is to be aerated for some time when the power source is not from the vehicle's 12 volt battery, a 12 volt marine or deep cycle battery (larger capacity) could be used as the power source.

Members of the Louisville Koi club have developed and used a nice transport tank system utilizing a 12 volt submersible bilge pump which pumps about 500 gallons of tank water per hour through a spray bar for aeration. They have kindly shared this system with a number of Koi hobbyists.

## OXYGENATION TRANSPORT TANK VERSUS CLOSED BAG

Multiple methods of aeration or oxygenation provide excellent levels of dissolved oxygen in

the transport tank water. Overall, pure oxygen from an oxygen tank with a regulator for fine control of the flow rate is favored. One advantage of this system of oxygenation is that the flow is quite gentle and minimal carbon dioxide (from the koi's respiration) is blown off so the pH does not rise. pH is a measure of the hydrogen ion concentration in the water. The higher the hydrogen ion concentration the lower the pH the more acidic the water. A change in pH from 8 to 7 reflects a 10 fold increase in the hydrogen ion concentration. A change in pH from 8 to 6 reflects a 100 fold increase in the hydrogen ion concentration.

The pH can increase with vigorous aeration as carbon dioxide is blown off. With the more alkaline water more of the ammonia would exist as unionized ammonia which is toxic.

In a closed bag system with pure oxygen in the bag, dissolved oxygen levels in the transport water remain high. I have measured dissolved oxygen levels in this closed, bag system after fifteen hours in transit. The oxygen saturation was 16 to 18 ppm, much above the 8 ppm needed for good aeration.

## ASPECTS OF AMMONIA

Let's consider some aspects of ammonia as it impacts Koi. It is a normal product of protein metabolism in Koi. It is excreted primarily through the gill - about 75%. It is potentially toxic and may cause death. Unionized ammonia (NH<sub>3</sub>) at 0.1 parts per million can be lethal.

Now, here's the good news. Unionized ammonia reacts with water to produce ionized ammonia (ammonium) and hydroxyl ions.

$NH_3 + H_2O = NH_4 + OH$  ionized ammonia (NH<sub>4</sub>) is nontoxic.

Ammonia toxicity is strongly dependent upon pH. Decreasing the pH (solution more acidic) has by far the greatest effect on decreasing the proportion of unionized ammonia in solution. The above reaction is driven to the right by decreasing the pH. A greater proportion of the total ammonia exists as ionized ammonia (NH<sub>4</sub>) which is nontoxic. At 50 degrees Fahrenheit and a pH of 7 only 0.2% (1 part out of 500) of the total ammonia exists as toxic unionized ammonia. Ammonia toxicity is also decreased by lowering the temperature, by increasing the salinity and by increasing dissolved oxygen. The major factor however is the pH of the water.

## CLOSED BAG: IMPACT OF AMMONIA

Fortunately, in a closed bag system the carbon dioxide (released from the koi's gill as a product of respiration) dissolves in the water to form carbonic acid which forms bicarbonate and hydrogen ions, increasing the acidity.

$CO_2 + H_2O = H_2CO_3 - HCO_3 + H$

More carbon dioxide yields more hydrogen ions. The bag water progressively becomes more acidic.

## SAKA NEWS

In a previous article concerning water chemistries during Koi transport (Koi USA, March/April 1977) water parameters were determined when the Koi were removed from their bags after being in die closed bags 13 hours. A single 20 inch Koi was in each of two bags. Each bag contained 3.5 to 4 gallons of water. The pH of the bag water when the Koi were placed in the bags was 7.4. The bags were filled with 100% oxygen and sealed. At the end of the 13 hour journey in our koimobile the pH of the bag water was 6.4 and 6.5. The carbon dioxide level was greater than 45 mg./liter in each bag and the total ammonia was 4-5 ppm and 4 ppm

Water pH and total ammonia levels were measured more recently when I received koi from Japan. The koi were in the closed bags just over 24 hours. The koi were slightly larger and each bag contained 4.5 to 5 gallons of water. The pH was 6.5 and 6.4, total ammonia was 6 to 7 ppm in each bag. In a closed bag inflated with oxygen the carbon dioxide released by the koi will progressively increase the acidity of the water to a level at which the ammonia will exist in its nontoxic form ionized ammonia. It is not harmful to the koi.

The maximum level of total ammonia acceptable with a pH of 6.5 and a temperature of 70 degrees Fahrenheit is approximately 14 ppm (extrapolated from Diagnostic Ammonia Chart in Summer 94 Koi Health Quarterly by John Redgrove). At 50 degrees F with a pH of 6.5, a maximum of 34 ppm total ammonia could be tolerated by the koi. The total ammonia in the transport water in the previous illustrations is well below the levels tolerated because of the acidification of the bag water by the retained carbon dioxide. TRANSPORT TANK: IMPACT OF AMMONIA

The pH of the water in a transport tank should remain stable. If anything, over aeration may reduce the carbon dioxide level in the water. This would slightly increase the PH of the water which would slightly increase the proportion of total ammonia existing as toxic non-ionized ammonia. At a temperature of 69 degrees F and a pH of 7.5 only 2 ppm total ammonia would be tolerated by the koi. Ammonia production by the koi will continue during transit. Dependent upon transit time, ammonia production and water volume, a potential toxic ammonia problem must be addressed.

One option could be water changes. This could be difficult out in the wilderness with no idea about the make-up of the local water (chlorine, chloramine, heavy metals, etc.).

I prefer to use pond water to prepare the transport water prior to transport so it corresponds to the pond water the koi are accustomed to. Our tap water has low alkalinity and hardness plus chlorine and chloramines. Sodium bicarbonate is added to bring the alkalinity level up and increase the buffering capacity. Calcium chloride may be added to increase hardness. NovAqua is added to dechlorinate the water. AmQuel is added to neutralize chloramine plus the anticipated

ammonia production during transit. This is estimated from fish load and anticipated transit time.

### TRANSPORT TANK WITH BIOLOGIC FILTER

A small active biologic filter associated with a transport tank is an interesting possibility. Certainly the potential ammonia problem could be eliminated. Since the transport systems discussed previously work well, I'll wait to see how this evolves.

### BEST CHOICE

The transport tank systems and the closed plastic bag system work well for long distance transport of koi.

How far? How many? How often? The koi hobbyist should use the system that is easiest for him or her. Understand that system.



**Kawarigo Korum**

## Up Coming Events

**October 23, 2005**

Faye & Winton Hall

**November 5, 2005**

PreLoad Party

9:00 AM @ Rancho Del Koi

## 26th Annual Koi Show

Southern Arizona Koi Association

FREE ADMISSION

**Raffle**

Win a color TV

**Auction**

Sunday noon

**Vendor Fair**

Saturday 9-4 & Sunday 9-3

**November 12th & 13th, 2005**

Kino Veterans Memorial Center  
2805 East Ajo Way  
Tucson, AZ

Admission from Kino Hospital



Information  
www.sakoina.org  
korman@akd.com  
akcobe@imn.com

## October 2005



**November 11-13, 2005**

SAKA 26<sup>th</sup> Koi Show & Auction

**December 2005**

Tom Ayers

January 22, 2006

TBA

February 26, 2006

TBA

March 26 2006

**Dan and Martha Cover**

**April 23, 2006**

**Debby & David Young**

**May 6 & 7, 2006**

**SAKA Pond Tour**

**May 21, 2006**

**The Klins**

**June 18, 2006**

TBA

25<sup>th</sup> Annual AKCA Seminar

Buffalo, NY

June 22-25, 2006

July, 2006

TBA

August, 2006

TBA

September 2006

TBA

October 2006

TBA

November 2006

TBA

December 2006

TBA

**26<sup>th</sup> Annual AKCA Seminar**

Phoenix Marriott Mesa

Mesa, Arizona

June 22-24, 2007

Hosted by SAKA & VSKC

**SAKA NEWS**



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**October 2005**



Annual Membership Dues are \$25.00 per family from March 1 to February 28 or 29 of the next year. If paid after August 1 \$17.50, September 1 \$15.00, October \$12.50, November \$10.00, December \$7.50.

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Today's Date: \_\_\_\_\_

# of Koi \_\_\_\_\_

Years Keeping Koi: \_\_\_\_\_

Pond size: \_\_\_\_\_

Would you like to host a meeting?  
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Would you like to serve on a committee?  
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\_\_\_\_\_ If yes which one?  
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