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Introduction to Ponds, Pumps

Water Gardens

WARNING

If you are considering building a new pond do NOT start until you have finished reading this primer at the very least.

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Introduction to important aspects of pond keeping

The information contained in this FREE primer is to allow all interested pond keepers to explore important topics that make a big difference in pond keeping. The source of the information is from various publications created by myself over the last few years.

To really take advantage of this knowledge and implement the ideas you would be advised to consider purchasing Tony's 4th Edition "The Complete Pond Solver"You can buy this and get a set of 10 important pond calculators totally FREE as well as an ebook about Water Lilies and Pond Aquatics also FREE.

These unique calculators alone are worth far more than the price of the book.

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Why Does A Pond with Fish Need A Biofilter?

Generally speaking a garden pond has too many fish for its own good. In a garden pond fish consume food and excrete waste products. The waste products build up in the water unless they are

continuously removed. In simple terms the pond water is also the toilet water.

The waste products are mainly ammonia, which is poisonous in even small quantities. If pond water is changed frequently then to some extent the poison levels are “controlled.” The more fish in the pond then the more the waste products to get rid of. Koi produce 3 times more waste than goldfish of the same size - because they eat 3 times more.
Ammonia is far more dangerous at higher pH levels as described fully in the book.

The food used has a significant impact upon the amount of waste produced. Do not use foods with high ash contents - this indicates low quality raw materials have been used in the food manufacture which result in water pollution levels being higher than necessary. In the book you will be shown how to save money on the food you buy.

In a natural stream or lake

Fish concentrations are generally low. Waste products are converted to relatively harmless nitrates by naturally occurring bacteria. Rocks, submerged trees, etc all help to purify the waste products from the fish by providing holding points for the bacteria to live on. The more bacteria there are the better the purification.

The bacteria need oxygen to survive and they get this from the water - oxygen is absorbed by the water through the action of waves, waterfalls and wind

In a garden pond

A biofilter is installed to make up for the unnatural conditions prevailing. A biofilter is designed to allow large concentrations of bacteria to operate effectively in a small area within a garden pond environment. Correctly specified and installed biofilters create very healthy environments in which fish can live and grow to their full potential.

In small ponds the filter can be installed directly in the pond. For larger ponds the filter needs to be installed outside of the pond. The pump connected to a biofilter must run 24 hours every day otherwise the bacteria will die from lack of oxygen contained in the circulating water.

It is a good idea to have a waterfall and a fountain to increase the oxygen content of the water. Once the bacteria have died it will take approximately 5 more weeks for them to regain their previous levels.

Learn more about biofiltration here http://www.clean-garden-ponds.com

Do not believe the stories about how big a biofilter must be. Many people will say it must be 1/3rd the size of the pond which is frankly ridiculous. The size of the biofilter is governed by the biomedium used and the overall system. Detailed explanations about the important design characteristics of biofilters is an important section in my book called “Your Pond: Crystal Clear Water – Guaranteed.”

Algae in A Pond

The single most common problem faced by pond keepers is the cloudy water pond ……
Yet the solution is permanent and simple.

Symptoms

This cloudiness is almost invariably the result of algae growth and is the reason the problem is worse in Summer than at other times of the year. The water is murky often quite bright green (like pea soup) although some algae are brown.
Water can be changed and after a few days the murkiness normally returns – a sure sign of algae.

The cause

Algae are plants. Algae therefore need food and oxygen and sunlight to grow and survive. Like most of us the more food, the more oxygen and the more sunlight the better and bigger the algae grow. In the right conditions the algae grow at an explosive rate - 30 times per hour!! This is why your swimming pool can be perfect one day and the next day it is totally green. You say to yourself how is this possible? - now you know why.

Not all algae are green and not all algae are minute in size and nor do they all remain suspended in water giving that pea soup appearance. Some algae join together and create long slimy stands but the water is perfectly clear. Other algae grow to about 1 to 2 cm in length and stick to pond surfaces, waterfalls or rocks etc.

We will talk about these 3 general types.

It is not necessary to give the latin names and species. What is important is the practical understanding of the situations you will encounter.

A. First of all the usual problem of green water (sometimes brown) which does not go clear and even after changing the water the algae re-appears very quickly and this happens even if you have a filter installed perhaps.
B. Green/brown cloudy water is normally caused by these millions of algae remaining suspended in the water. Each

algae is about 4 microns in diameter (1 micron is 1 millionth of a metre or very very very small).

C. The reason why algae is not removed in many filters is due to its small size - if the medium in your filter has gaps/pores greater than 4 microns in size then the algae will just get recirculated. By the way most filters suffer from this design problem.
D. Algae growth is most common in ponds where conditions are most suited to their requirements - lots of fish being fed lots of food, warm water as it is in summer here, and strong sunlight. The waste products from fish eventually create nitrates in the water and most pond food contains phosphates and lots of nitrogen. These are fertilisers for plants as you know from general gardening. Equally they are fertilisers for algae - remember algae are plants.
E. If there was no nitrate and phosphate there could be no algae. This comes back to Valerie's question. Even though Valerie did not have fish she had algae so where did the food come from. It came from the tap water almost certainly. All tap water contains nitrates and in some areas probably phosphates. Also wind blows debris into ponds and water features and these debris also contain these substances.

How to remove the algae

We must unfortunately accept that even in the best ponds algae will always be a threat. By far the best way and it works every time for this type of algae is to install a CORRECTLY SIZED UV light before the filter. This works very simply. The algae pumped through the light (and only those pumped through the light) are killed by exposure to UV light. Upon dying they clump together becoming much bigger than 4 microns. Because they are now much bigger this means most well designed filters are able to remove the dead algae. In all likeliehood the algae are still forming in your pond but they are being killed by the UV light FASTER than they are forming.

It is important to remove the dead algae in a filter because if they are allowed to sink to the bottom of the pond they can pollute the water quite badly.

You can learn more about UV lights by going to my web site http://www.garden-ponds-algae.com

When a pond is badly infected by green water then your fish can all suddenly die and this happens overnight normally. The reason is again simple and is because algae are plants - they produce oxygen

during the day (in the photosynthesis process) but they produce carbon dioxide at night by taking oxygen out of the water. Algae in large mass can totally deplete the oxygen from a pond. The fish therefore suffocate. This is also very much more common in heat wave situations like we are presently experiencing because at higher temperatures water can hold less oxygen anyway.

Algae can be controlled by using any algaecide but read the instructions and beware of environmental problems. One of the best because it totally harmless to all wildlife and plants in water features is Biotal ALL CLEAR. These products are also effective in ponds but have to be used continuously and are thus very expensive cures over a period of time.

One of the very best inventions in pond keeping was the UV light.

B. Algae that grow to about 1 cm in length and are seen on pump surfaces, rocks, pump filter sponges and the sides of ponds are normal. Do not try to remove them by sweeping the pond walls for example because they will keep coming back and if left alone reach an equilibrium point. The fish love them and the balance of the small pond is improved.

They can be a bit unsightly sometimes but this is natural. They will not damage your pond environment. A UV light will not effect these algae in any way because they stay in one position and are NOT exposed to the UV light.

The enigma of blanketweed.

Blanket weed is that long slimy algae that seems to grow and grow and can never be eradicated. Many pondkeepers never see it and others are never without it. It is an area of pondkeeping not well understood and many of the suggested solutions do not always work. UV lights are no good because the algae is not exposed to the light - it remains in the pond.

Often even when there is lots of blanket weed the water is crystal clear. This is because the blanketweed is starving other algae out of existence.

Water quality certainly plays a role in blanketweed development but this is not the whole story since even the best pondkeepers can get this problem.

By improving the balance between plants in the pond and reducing fish density and therefore reduced feeding the tendency to

blanketweed will be reduced but not necessarily eradicated. Plants in ponds compete with the algae for the "fertilisers" produced by the fish as explained earlier.

Recent product developments particularly around barley straw products have been.

Be careful when buying chemicals to kill blanketweed - make sure they do not kill anything else including plants, fish, filter bacteria, birds that drink the water etc.

Koi and goldfish like warm water and summer weather. They eat more food and they create more waste. Algae and plants also like it. The plants grow more quickly and there is more food from the fish waste.

The result is that algae problems will tend to be far worse than you might remember. However remember also that it is *impossible* to stop algae forming in a pond environment - THIS IS NORMAL AND NATURAL. All you can do is control the amount of living algae by using an UV for example.

The practical implications are that you will need to clean your pump sponge more frequently and maybe also your main biofilter.

Algae on the sides of a pond (up to say 2cm long) or on the stones in a pond is GOOD and NORMAL.

Let's talk about pond pumps.

Once you have read this chapter I suggest you go to
http://www.pond-pumps.com

In a large lake high winds do the job of a pump. These winds circulate the water and mix it very thoroughly. Through the actions of waves life-giving oxygen is added to the water and pollutants are mixed with the body of water in order to dilute the toxic effect resulting from fish waste and other contaminants.

Any body of water, small or large that is not circulated will become stagnant very quickly. Stagnant water becomes a breeding ground for pathogenic bacteria of all sorts. These bacteria kill fish and create smells.

A pump is therefore very essential in any garden pond.

In South Africa I am sure that most people when they buy a pump get poor advice and end up buying a pump which is unsuitable for the job. In choosing a pump there are very important factors to consider.

How much water will the pump handle under the conditions pertaining to your own pond?
How much pumped water is ideal for my pond?
How much money will it cost to buy?
How much money will it cost to run?
How reliable will the pump be?
How will my problems be handled if the pump fails?
How can I save money and still achieve all necessary functionality?

The calculators offered with my book will guide you to making very significant savings in running your pond.

Consider each of these items in turn:

1. For 99% of garden ponds the pump you choose you should be submersible and NOT the swimming pool type. When you submerse the pump in the pond keep it off the bottom by placing the pump on a brick or something similar. In this way dirt from the pond bottom is not sucked into the pump.

BE AWARE THAT A POND PUMP MUST RUN 24 HOURS PER DAY EVERY DAY IF YOU WANT YOUR BIOFILTER TO FUNCTION.

2. Place the pump where you can EASILY get to it for maintenance purposes (number 1 priority) and also in such a way to minimise the length of pipe from the pump to the filter or waterfall.

3. Make sure the electrical connections are made safely. All outdoor pumps must have 10 metres of cable attached to them. If they do not then the retailer is breaking the law by selling such a pump to you. Do not accept any pump for outdoor use unless it has 10 metres of cable. We are talking safety here. Do not lift the pump using its cable - tie a sting or wire to pump if you need help in lifting the pump from the bottom of the pond.

4. To choose your pump you need to know how much water you want to pump and to what height above the water surface you want to pump the water - notice I said from water surface and NOT the bottom of the pond.
These two variables we call Volume flow rate and Head respectively. These are normally expressed in litres per hour and metres.

Any submersible pump can handle various combinations of flow and head. Think of it this way - the motor on the pump pushes out a fixed quantity of energy. It can use this energy to pump less flow to a higher level OR more flow to a lower level.

Be careful when you see maximum flow and maximum head readings on a pump box. The pump cannot do maximum flow and maximum head at the same time. In fact maximum flow occurs when head is ZERO. Conversely maximum head occurs when flow is ZERO. You can see this for your self by attaching a pipe to the pump outlet and then slowly lifting the outlet of the pipe. You will notice as you lift the pipe the water coming out will get less and less until the flow stops completely.

5. For most ponds the desired flow rate and this is a flow rate that will suit plants, fish, biofilters, UV lights and anything else in the pond is about half the pond volume every hour. If your pond is 3,000 litres then your pump should push out about 1,500 litres per hour. In this way the contents of the pond are turned over 12 times every day. It does not matter if the flow is a bit more or less. If you pump too much you just waste money since the more flow and/or head the larger and more expensive the pump in terms of initial cost and running costs. The only good reason for pumping more water is if you want to

create an impressive waterfall - please remember we are talking in these articles about smaller garden ponds and not large koi ponds.

6. Now you know how much water to pump then all that is left is to decide how high you want to pump the water. If you have a waterfall then this height is measured from the pond water surface (not the bottom of the pond remember) to inlet point to the waterfall.

7. Knowing these two variables selection of the right pump becomes much simpler. In addition to these items, forgetting cost for the moment, check to see if the pump has additional features such as valves and fountain jets that may be included with the pump. These items can be expensive when bought later. If you do have a fountain then this will result in less flow going to the filter. Consequently if you want a fountain and a waterfall you might want to go for a somewhat larger pump.

8. At The Pond Professor's main web site you will find a link that will allow you to easily and confidenly choose the right pond pump first time.

9. Pump costs - most people only ever consider the purchase price of a pump. I have yet to meet a retailer who has ever mentioned running cost in advising pump selection yet in most cases this is far more important than the initial purchase price.

In South Africa you will see many pumps offered at relatively low price yet these pumps can pump large volumes at significant head - one is advertised almost every month in the SA Gardening Magazine. As a result most retailers like to sell these "advantages" to a consumer. In fact these so called advantages are large "disadvantages." It is not unusual for these pumps to cost as much to run in 12 to 18 months as it did to buy the pump. And like diamonds A Pump Is (or should be) For Ever or at least quite a long time which means you are going to pay for electricity for a long time to come and electricity goes up every year.

A good pond pump for ponds up to 6,000 litres will normally consume about 20% of the power required to run the pumps just discussed. One of the FREE calculators allows you calculate exactly what your own pump in your own country will cost to run

South Africa ONLY: You can check how much per year the cost will be to run your pump - look at the watts consumed (should be on box) and multiply by 2.6. This will give you a good estimate. If you do not see the watts power consumption do not buy the pump.

Go out and check your pump and have a good look at it. Pumps that are expensive to run are external swimming pool type pumps and upright submersible pumps.

10. Lets look at a simple but highly effective way to minimise pump running costs for those special situations. I know many people like the idea of a roaring waterfall even though a trickling/tinkling sound is far smoother on the ear. For these people there is a real alternative to buying that large power guzzling pump. The answer is very simple - buy 2 smaller pumps. This way you can actually save a lot of money. The situation is discussed in detail in my book – this idea and tip alone is worth far more than the cost of the book.

11. Always buy a pump for a pond with at least a 2 years guarantee. If the pump has less than a 2 year guarantee DO NOT USE IT IN A POND.

12. For no hassle guarantee performance buy reputable pumps from reputable retailers. If you do not get sound common sense advice and if the retailer does not understand what you now know then consider going elsewhere to buy your pump.

Water Quality Basic Introduction

You look into your perfectly clean and clear pond, you see fish darting around, they come to your hand to feed having lived happily in their home for well over 2 years. The plants are growing well and you are pleased with your investment and especially that you have never lost a fish.

This desirable situation is made all the more possible when you understand something about water quality and what is happening in a pond.

The fundamental and single most important factor behind good water quality is excellent biofiltration. Poor filtration will undoubtedly create poor water conditions that in turn will result in water looking poor, fish disease and even death.

There are specific parameters that indicate good or not so good water quality. Before talking about each of these in turn lets look what happens in ALL ponds containing fish and especially what happens just after feeding takes place.

1. The fish eat the food and secrete nitrogenous chemicals from their gills and bladder. The main chemical is ammonia - that's the chemical with a very pungent smell that is contained in some household cleaners. The more food eaten then the more the ammonia produced.

2. If all is well in the pond biofiltration process the ammonia is diluted and quickly converted in the biofilter to another nitrogenous (contains nitrogen) chemical group referred to as NitrITEs. As time proceeeds and all being well this happens very quickly the nitrites are converted to NitrATEs.

Remember the following: nitrITEs are very poisonous to fish and nitrATEs are about 500 times less poisonous to fish. Ammonia is the most poisonous of all three.

3. This sequential conversion process from ammonia via nitrites to nitrates takes place in a biofilter in the presence of two special bacteria AND oxygen and certain mineral requirements normally contained in the water in small quantities. The bacteria need oxygen to live and metabolise and to also drive the oxidation process that first of all converts Ammonia to NitrITE and then this to NitrATE.

No oxygen means no conversion and therefore poisonous conditions in your pond will prevail.

4. Now in the beginning and if you have few fish and lots of water and no biofilter the poisonous chemicals will be diluted and may not pose an immediate threat. However when you feed again the levels get higher and so it goes on until one day your fish start looking sick, becoming short of breath (come to surface and try to gulp air), swim haphazardly and maybe even die. If you change the water or portions of it frequently you can lower the levels of poisonous chemicals. The writing is however on the wall. Unless you prevent the build up of ammonia and or nitrITEs your fish will one day die.

5. How would you like to live in your own toilet?

6. When a new pond is built and the intention is to hold fish it is IMPERATIVE that a biological filter of adequate size and good design is installed. Even when you install the filter it will still take up to six (yes 6!!!!) weeks for the biofilter to start to function at high capacity. This is the time it takes for the level of bacteria to build up to sufficient numbers to do a good job of converting the poisonous chemicals to more friendly chemicals namely nitrATes.
The biological filtration process also cannot start unless there is a source of nitrogen for the bacteria to consume. So a small quantity of fish is required to start the process - in other words waste product from the fish is the food source for the bacteria.
These first fish in a new pond will take some strain inevitably so do NOT put too many fish in a new pond and certainly do NOT put that prize koi in the pond for some 6 weeks or so.

7. How do you know if the level of ammonia or nitrite is too high in a pond? There is only one way. You have to measure it using test kits. If you do not want to take this trouble (I do however recommend it) then in the first couple of months of installing a new pond with a biofilter do frequent water changes - say 50 litres per day in a typical smallish garden pond and do not overstock with fish. After the 6 weeks are up introduce more fish slowly and not all at once. Give the biofilter time to adjust to the higher levels of ammonia that will be produced following the introduction of more fish.

8. In the highest quality pond water there is no ammonia and there is no nitrite except for a very short period after feeding takes place.

This is your sole aim of biofiltration namely to get the poisonous chemicals secreted by fish down to virtually ZERO concentration levels. The fact that the biofilter also removes solids is a bonus.

The following parameters are important in good pond keeping in addition to the above:

a. High levels of oxygen
b. Low variations in pH of the water
c. Good levels of carbonate hardness
d. The absence of pathogenic bacteria

The vital importance of Oxygen

Most of us in South Africa live in higher altitudes where the oxygen concentrations are lower than at sea level. This is why our cars go faster at the coast and we go to bed earlier in Johannesburg. If we lived at 12,000 ft we would get even more tired. On top of Everest we cannot breath without assistance.

Fish are like that and so are bacteria. Starve them of oxygen and they suffer just like us.

Peter Waddington who is probably the world's most famous koi keeper spent a week doing seminars for me in South Africa about 5 years ago. If I learned nothing else during all those seminars I attended with Peter as my guest it was that you cannot overdo the addition of oxygen/air. Peter's own pond and filter literally bubble with air which is continuously pumped into the circulating water, the filter and the waterfall as well as the pond 24 hours a day 365 days a year.

By the way my pond does not have any additional sources of oxygen than a waterfall and a second water flow into the pond from the biofilter. BUT I only have 6 smallish goldfish and great biofiltration. This means my system is understocked and over designed. If I doubled the fish mass I would probably need to introduce more oxygen into the pond.

There are some things you really do need to know about what happens to the oxygen concentration in your pond under different conditions. In this short discussion I will state matters factually and illustrate by numbers where I can:

a. Water can hold less oxygen the higher the temperature rise in the water. This means that in January (in the southern hemisphere

where I live January is mid Summer) there is much less oxygen in a pond than in July when the water is much colder. This is why trout need cold water - they need high levels of oxygen which they cannot get in warm water. This is also why we have to drive 2 hrs + to Dullstroom to find good trout fishing.

Oxygen is introduced to water at the pond surface and by any mechanical means such as use of a fountain, waterfall or air pump etc.

During the last number of weeks in Johannesburg we have suffered from high temperatures and I bet many ponds have also.

At 10 deg C at sea level water can hold 10.9 mg/litre of oxygen. At 20 deg C it can only hold 8.8 mg/litre and at 30 deg C the saturation level is 7.5 mg/litre.

In practice very few systems reach these saturation levels and this is the reason Peter Waddington blows massive amounts of air into his pond and filter in order to get as close as possible to saturation.

Plants are always a good idea in a pond because they introduce oxygen into the water during the warmer parts of the 24 hour daily photosynthesis cycle. The higher temperatures occur during the day when oxygen concentrations would tend to be at their lowest due to higher temperatures. The plants however greatly assist by replacing any oxygen consumed by the fish/bacteria. At night however the plants reverse this process by using up oxygen from the water and converting it to carbon dioxide and then to carbonic acid. This is also another reason for maintaining pump flow 24 hours per day so that circulating water continues to pick up oxygen during this night time period and provides new sources of oxygen to compensate for that taken up by the plants.

Last time I made the point that in ponds where high levels of algae existed then these algae could totally deplete a pond of oxygen overnight causing total fish loss.

In summary you cannot overdo the introduction of air into a pond. Blow, blow, blow if you want to.

b. pH and the Pond
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In a swimming pool if you measure the pH at noon and again at midnight it will be the same. In a pond with plants it will not be the same because of the photosynthesis cycle. During the night the pH will fall before rising again during the day to its original level. With

high levels of algae the pH can change dramatically with dire consequencies. Do go to http://www,garden-pond-algae.com

pH is a measure of the acidity or alkalinity of water. The measurement scale is from 0 to 14. At the mid point of the range the water is neutral since the acid and alkali balance each other which is the case for pure water. Less than 7 the water is acidic (vinegar is less then 7, a lemon is about 2.2). More than 7 and the water is alkaline (sodium carbonate is a good example and milk is between 7.1 and 8.5).

Stable levels of pH are desirable and a range between 7 and 8.0 is good for a pond. When you start seeing levels of 9 there is a danger developing.

It is not a simple subject however to talk about pH even though it is simple to measure. The reason is that pH has a great influence on almost everything in a pond environment. It effects how the biofilter works, it effects the fish, it in turn is effected by the addition or removal of pond water and whether the water from the tap in your region is hard or soft. At higher pH levels toxic levels of ammonia become very deadly.

To have a high level of control over pH fluctuation it is very important to have a good level of hardness in the pond.

pH and Water Hardness

To minimise the natural pH fluctuations in a pond it is very important to have a good level of hardness in the pond. What is this hardness?

When you wash your hands in water and you find it difficult to get a good lather (even using Dove soap) you are in an area where the water is naturally hard. Conversely when the water feels slimy when you wash your hands the water is called soft. Where I live some 15 kms east of Johannesburg the water is probably in between.

Hardness in water is caused by high levels of dissolved salts and particularly magnesium and calcium salts.

There are also 2 types of hardness - permanent hardness and tempoarary hardness. Water which has permanent hardness has a lot of magnesium and/or calcium SULPHATE salts as well as some other salts. Temporary hardness is due to magnesium and/or calcium CARBONATES. If you look inside your kettle you might see deposits of white or grey solids on the heating element. This is CARBONATE coming out of the water when it is boiled and this is why it is called temporary.

CARBONATE hardness is very important in a pond in order to control pH.

The total of the SULPHATES and CARBONATES in water is called permanent hardness or TH for short. The amount of CARBONATES only is called temporary hardness and is referred to as CH for short.

Total hardness (TH) is important for the good physiology of fish.

The following is what happens in a pond which has a low level of CARBONATES.

During the day any plants (and this includes algae which is a plant) in the water remove this small amount of carbonate and as a result the pH of the water can climb significantly and maybe even reach a level of 9. At this level ammonia secreted by the fish themselves is EXTREMELY poisonous to fish and your fish can die - under these conditions your fish will appear very distressed, gasping for air, lying on their side, lethargic and so on. If there were higher levels of CH in a pond it would be impossible for the pH to rise to 9 and it would also remain a lot more stable which is much better for fish.

If you suspect ammonia poisoning then immediately test the water for ammonia. If the test proves positive start changing some of the pond water immediately (say 50%) and DO NOT feed the fish - fish can live happily without feeding for days on end. Keep changing portions of pond water until you are able to stabilise the situation. Keep measuring the ammonia levels in the water.

Think of CH as preventing pH from fluctuating widely and reaching dangerously high levels. This is good for fish and plants in a pond. That is all you need to remember.

Good levels of TH in a pond are 7 to 14 degrees

Good CH levels in ponds are 6 to 12 degrees

The only way you know if you have the correct levels is to test the water yourself by buying a suitable test kit or take a water sample to a fish outlet with these testing facilites.

If you find the hardness is too low then select a product from the shelves to correct the problem and follow the instructions carefully.

It is also a good idea to test your tap water to see if it is hard or soft so you can forecast what might happen over a period of time.

Acceptable Values For Pond Testing

Ammonia: Nil
Nitrite: less than 0.3 mg/litre
Nitrate: 25-100 mg/litre
pH: 7.0 - 8.0
CH: 6 - 12 deg CH
TH: 7 - 14 deg TH

Spring and Pond Keeping

Quote from www.genesyz.com web site:

Spring Fever kills thousands of Koi each year and up till now Koi and fish keepers have been relatively helpless. There are of course loads of medications and potions all claiming to eradicate this or that but all are basically chemicals or antibiotics and while some work they all have a downside, as they are all basically chemicals and who wants to put chemicals into a fish pond?

Many ponds meet serious problems when weather starts to warm up as it does in Spring. The problems encountered are often bacterial disease problems such as ulcers (this is probably most common) identified by sores appearing on sides of your fish that even develop into holes. Treatment is difficult and expensive and often leads to other problems because antibiotics are involved.

There is only 1 product I am aware of that prevents this type of disease. It is called Lymnozyme in USA and Genesyz in UK and RSA.

It does not cure diseases caused by aeromonas and pseudomonas bacteria (those responsible for many problems) but reduces their population to very very low and non-dangerous levels using a well known biological process called "Competitive Exclusion".

If you want to know more take a look at The Pond Professor's main web site under fish health care.

Other problems to look forward to in Spring and early Summer are green ponds - one simple reason if you have an UV - your lamp probably needs changing. These UV lamps do not last more than 8,000 hours (less than 1 year). They may still shine but they are not emitting UV in sufficient concentration to be effective.

Often with the increased feeding rate that will start to happen in Spring your filter may not be able to handle a sudden and large increase in ammonia. Do things gradually is the simple message.

I hope you have been feeding your fish during winter unless they were totally motionless in water below 8. Fish in poor physical condition after a difficult winter are most prone to disease attack.

Ponds in Winter

My main web site www.practical-water-gardens.com will lead you to some excellent over-wintering articles (for the Northern Hemisphere) written by Peter May, one of the UK's top water gadren landscapers.

This article refers to winter in South Africa (not winter in harsh climates like Canada, Northern Europe and so on). Be aware of this as you read it.

I am often asked if a biofilter could be commissioned successfully in winter when temperatures fall.

In winter in Johannesburg and other highveld areas (parts of Arizona, parts of California and so on) night-time temperatures fall dramatically and as we all know swimming becomes impossible. In ponds and especially large and deep ponds temperatures can fall to and remain at temperatures around 8 degrees centigrade for short periods of time. In these ponds you will notice perhaps that koi tend to go to the bottom and remain there motionless. This is the sign to definitely STOP feeding but I will come back to this point later.

With regards to filtration it is still possible for a biofilter to be commissioned but it will take longer to mature and high doses of ammonia will take longer to get under control using even a mature filter ammonia becomes evident. The important point to bear in mind therefore is if temperatures are low feed less and preferably feed earlier in the day while water is warmer giving time for fish to digest the food. In this way the load on a biofilter is reduced anyway

As far as a new filter is concerned put less fish in than you might under summer conditions.

Now lets talk about winter feeding.

Point 1 - there is a school of thought which says stop feeding your koi when temperature reaches 10 degrees. This rule is responsible for many fish deaths - the fish might not die in winter but they die in Spring when general pond activity picks up.

Point 2 - imagine yourself being denied food in winter when you were hungry and moving around. Come Spring you would not be in very good condition. If you are in poor condition you become susceptible to all sorts of disease. One reason why HIV is deadly in humans and particularly in under-developed nations.

The truth is as follows:

If your fish are swimming around they are hungry and need sustenance. Sure they need much less food but they need it and make no doubts about this. Fish are very clever - they do not waste energy and move only in search of food. When food is no longer important they lie motionless on the bottom - almost hibernating to conserve energy.

Of course there is a lot of technology and science in a pond environment and exploitation of this science allows koi to be well looked after, live for a very long time and grow large. Most koi keepers however have limited funds to implement technological solutions (like heating a pond in winter to maintain 15 degree temperatures) and just want to enjoy their pond. This is where common sense plays a very important role.

Common sense should always be a test of any "rule" particularly when this "rule" is passed from mouth to mouth to the extent it becomes dogma. The koi world we enjoy so much is full of dogmas!!! I am going to get sharply criticised by some people for expressing these views again but the truth must come out.

Therefore feed your fish small amounts if they are swimming around.

What is critical is the quality of food at low temperatures. The food must have easily digestible protein sources and all correct vitamins and trace elements - wheatgerm is the common and often recommended source of this type of protein but this food lacks almost everything else the fish requires.

So apply the common sense rule. Is it better to feed wheatgerm or a balanced food that contains highly digestible proteins AND trace elements AND vitamins or is it better to supply wheatgerm? Dealers make more money out of selling wheatgerm in addition to normal food.

So how do you know if the proteins are higly digestible - the one very quick test is to read the ash level on the food label. If more than 5% ash then the protein source is suspect - good protein sources do not have a lot of ash in them.

Ash is an indication of the fact that low grade raw materials are used - bones, scales, inorganic fillers etc all of which show up as ash in the final food. If a food does not supply reliable analysis figures on

the label DO NOT BUY THE FOOD. Also ask the dealer the questions as to analysis.

By the way ash and moisture add nothing to the food and are a waste of money - unfortunately it is impossible to avoid ash and moisture altogether.

Consequently if a 5 kg bag of food contains 12% moisture and 13% ash then 25% (a whopping 1.25kg) of what you bought is just going to pollute the filter since it will come straight out of the rear end of the fish. This is what I mean by a common sense approach to pond keeping and saving money and improving your system. Have you ever noticed the large amount of faeces on the bottom of your pond? This is mainly ash from low quality food.

If you want to cross reference this point compare what you see on your lawn if you feed your dog a common dry dog food as against what you see when you feed one of those more expensive foods you only find at the vet. You will see very very much less mess. Your dog will also eat less kgs and will be in better condition. Makes sense to me.

In the same way a food containing 35% protein contains 40% more sustenance than one containing 25% protein. This is a major difference and not just in value. Koi need high protein levels to develop well.

Ask yourself a simple question. What is the point of spending good money on ponds, filters, pumps, koi and then trying to save a few Rands on food? In any case a fish needs a certain amount of protein. A fish will need far less food of 35% protein than it will of one containing 25% protein - in fact 40% less. At the end of day the total food bill will be the same although good quality food may cost more per kg.

Hopefully this short booklet has given you an insight to the wonderful but challenging hobby of pond keeping.
The more you understand the better will be the lives of your fish and yourselves in terms of being able to really enjoy the pond you have or intend to get.
If you do not have a pond DO PLEASE consider purchasing my book. It will not only save you lots of money but you will have an asset that you will be proud of instead of a potential eye-sore year in and year out.
You can get it here:
www.really-useful-books.com