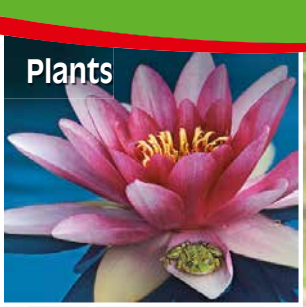
My pond



sera® guide

Professional advice for ponds, with algae checklist

Contents

A pond, whether big or small, adds to every garden, patio or even balcony.

Maintenance efforts can be kept low if you observe some important points, and there will be plenty of time for enjoying. We therefore want to give you a little overview about the most important aspects of correct pond planning, required maintenance measures and keeping fish and plants in your little biotope.

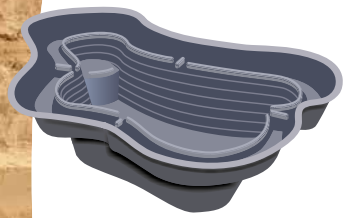
Choosing a location:

- ✓ *preferably in a partially shady place with a few sunny hours per day*
- ✓ *as much distance to trees as possible (threat of pollution by leaves)*
- ✓ *electricity supply for pump and filter must be provided*

Building a new pond

When planning a pond, you should consider that the minimum depth must be at least 1 m (3.3 ft.) if you wish to keep fish later on. This is the only way that allows animals to hibernate without any problems. Furthermore, the pond should be as large as possible, because a pond will maintain itself the better the larger it is.

Prefabricated pond or individuality?



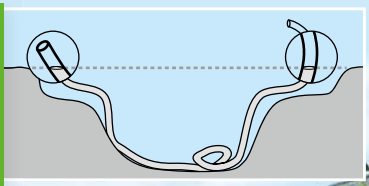
Prefabricated ponds have the advantage of being very stable, and they provide a quick solution especially for small gardens. However, they are rarely deeper than 80 cm (32 in.), and thus are suitable for keeping fish only to a limited extent.

A liner pond allows more individuality and can be tailored to the garden environment. It can also be altered later on if required. However, great care is required during setup as even small inattentiveness may lead to severe consequences.

Great miniature ponds

Old zinc tubs or decorative wooden tubs lined with pond liner are suitable for creating a miniature pond on your patio or balcony. They are a true eye catcher when planted beautifully. Although these tubs are of course too small for keeping fish, they are very attractive with a lively water display and the colors of the plants.

A tip:
A so-called hose level easily allows determining the heights of the pond edges so they can quickly be brought to the same height. This avoids unsightly pond liner being visible when the pond is full.



A tip:
You can create a nice raised bed with the excavated soil from your pond. Maybe you would also enjoy a little brook running into your pond always supplying it with fresh oxygen.

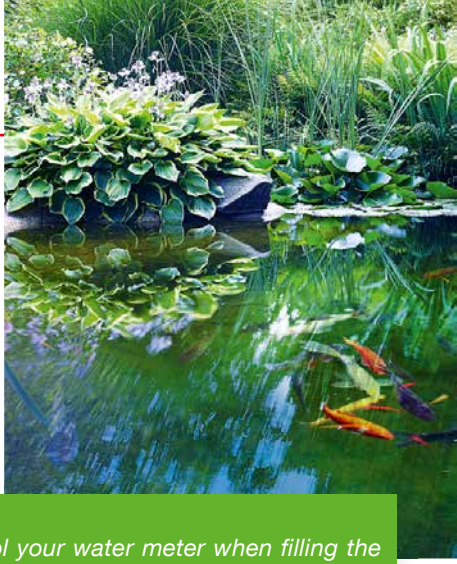
Well planned

A clear sketch of the planned pond helps you realizing your project. While planning, bear in mind that the pond should provide various horizontal levels for plants, as these are hard to attach to slopes and prefer different water depths, depending on their species. The required pond liner amount is now easy to determine. 70 cm (28 in.) of liner should be additionally planned, these even out possible imprecisions and allow for easy edge designs. Once the pond pit is excavated, it is important to remove pointed stones and similar objects. In case of irregular soil consistency, it is advisable to use a little sand for smoothing out these inconsistencies.

A protection mat laid underneath the liner also protects against stones you may have overlooked. Then the liner is laid. Be sure to smooth out creases as carefully as possible, as otherwise rotting sludge may be trapped in them. Depending on your taste, you can put gravel or larger stones in the pond as bottom material or for decoration – never use garden or top soil, as this may lead to uncontrollable algae growth.

Water at last!

A large part of the work is now done – the pond finally gets its shape and can be filled with water. Remember that water is to fish and plants what air is to humans. You should therefore give this special consideration.
Preferably, tap water is used for the first filling. It hardly contains any undesirable substances that adversely affect fish and plants.



A tip:
Control your water meter when filling the pond. You can determine the exact water amount this way. This is required for dosing pond care products or treatments. It also allows determining the maximum number of fish you can add and the required filter performance.

Well water

The composition of well water strongly depends on the environment and thus may be an incalculable threat.

Rain water

Rain water contains very few essential minerals. Heavy rainfalls can thus adversely affect water quality. However, small amounts can be used for topping up the pond. However, you should add **sera pond bio balance** before pouring it into the pond as to compensate the mineral deficiency, and **sera KOI PROTECT** for binding harmful substances.

Tap water

The strict quality requirements imposed on tap water make it an ideal basis for pond water according to nature. Now add **sera KOI PROTECT** for conditioning the water for fish and plants. Possibly present heavy metals and chlorine are bound this way and lose their harmful effects.
Water quality is crucial for a maintenance friendly pond. Poor water quality may cause stunted plant growth, algae blooms and even fish diseases. For preventing this, the most important water parameters should therefore be checked regularly in every pond, independently from its size. **sera** offers the **sera Quick Test** to do so. Simply hold it into the water and read off the most important parameters within a minute. We recommend the **sera aqua test-set** for more exact measuring, and the **sera KOI AQUA-TEST BOX** for experienced pond keepers.

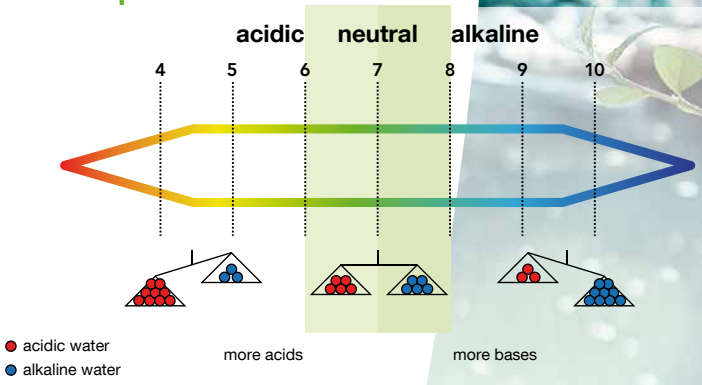
In the following, you will find a short overview about the parameters which are important in a pond, what they mean and how they can be corrected:

pH value

The pH value provides information whether the water is acidic or alkaline. The scale ranges from 0 – 14, the ideal value in ponds is 7.0 – 7.5. This parameter is subject to strong variations caused by plant activity or rain. Values between 6.8 and 8.2 may thus be considered alright.

A tip:
Water parameters in ponds strongly depend on the time of day, the weather and many more parameters. They should therefore always be checked at the same time of day.

Acidic or alkaline – the pH value



Water hardness

The water hardness is mainly described by total hardness and carbonate hardness.

The **total hardness (GH)** is defined as the amount of dissolved calcium and magnesium in the water. These two minerals are indispensable for healthy growth of fish and plants.

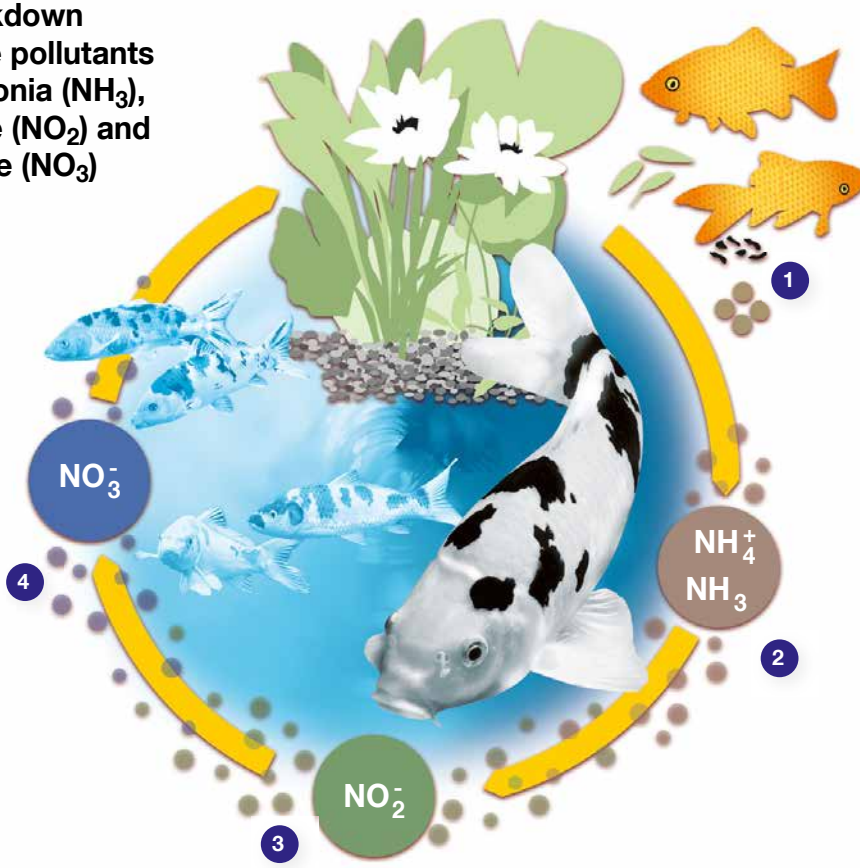
The **carbonate hardness (KH)** is one of the most important water parameters, and is often described together with the pH value as it is able to stabilize it. This means it buffers variations, and the pH value does not get into regions which are toxic to fish unnoticedly. The KH should always be above 5°dH. We recommend **sera pond bio balance** for increasing both total hardness and carbonate hardness, and thus for stabilizing the pH value. **sera pond bio balance** should also be dosed after strong rainfalls or a water change.

Water at last!

What is the "biological equilibrium"?
When speaking colloquially about the biological equilibrium, this in most cases refers to the so-called nitrogen cycle. Once it has established in a pond, pond keepers may lean back and let natural self purification powers do the work. The nitrogen cycle is schematically shown here:

1. ***Too much food, fish waste and dead plant parts pollute the water***
2. ***Purification bacteria first convert pollutants into NH_4^+/NH_3 (ammonium, ammonia)***
3. ***Purification bacteria convert NH_4^+/NH_3 into NO_2^- (nitrite)***
4. ***Purification bacteria convert NO_2^- into NO_3^- (nitrate) = plant nutrient***

Breakdown of the pollutants ammonia (NH_3), nitrite (NO_2) and nitrate (NO_3)



Phosphate (PO_4)

Phosphate enriches as a breakdown product from plants, but also by excess feeding in a pond. It serves as an essential nutrient for plants. Unfortunately, algae also benefit from high phosphate levels. It should therefore be checked regularly, and be removed in case of positive detection. **sera pond phosvec** is particularly well suited for this purpose. It binds phosphate quickly so it is not available for algae any more.

Nitrite (NO_2)

Nitrite is a fish poison which is quickly broken down to nitrate in a healthy pond and thus has no influence on the animals. No nitrite may be detectible once a healthy biological equilibrium has established in the pond. In case you nevertheless detect nitrite, only quick application of **sera pond toxivec** helps preventing the fish being harmed.

If nitrite (NO_2) or ammonium/ammonia (NH_4/NH_3) enriches in a pond, it is a clear sign that the biological equilibrium has gone out of balance: there are insufficient purification bacteria that can break down the pollutants ammonium or nitrite. **sera pond bio nitrivec** helps in this case. It contains live micro organisms that can immediately take up work.

It furthermore contains mineral volcanic rock that binds pollutants and cloudiness in the pond.
Micro organisms breaking down ammonium and nitrite are also called “filter bacteria”. This, after all, has two reasons:

On the one hand, they are responsible for the biological filtration by removing pollutants, on the other hand they prefer settling in filters for performing their work there. It makes therefore sense to provide a surface within the filter as large as possible for these filter bacteria so they can settle it.
sera siporax pond, the unique biologically activatable high performance filter medium provides the largest possible surface. The surface of one liter (1 US quart) **sera siporax pond** (25 mm/1 in.) provides a surface of 200 m² (239 yd²). **sera pond bio nitrivec** should always be added to the filter for the first settling and after every cleaning. Furthermore, we recommend regular dosage of **sera pond filter biostart**. It accelerates **sludge** breakdown and prevents unpleasant odors. The highly active micro organisms and enzymes quickly break down dead leaves, fish waste and uneaten food and support the work of **sera pond bio nitrivec**.

Filter technology

Pressure filters

Besides the already mentioned biological filtration, pond filters also clean the water mechanically, i.e. unsightly floating particles are being retained by various filter media. You can basically distinguish between a pressure filter and a flow-through filter. The water is directed through the chambers under pressure in case of a pressure filter.

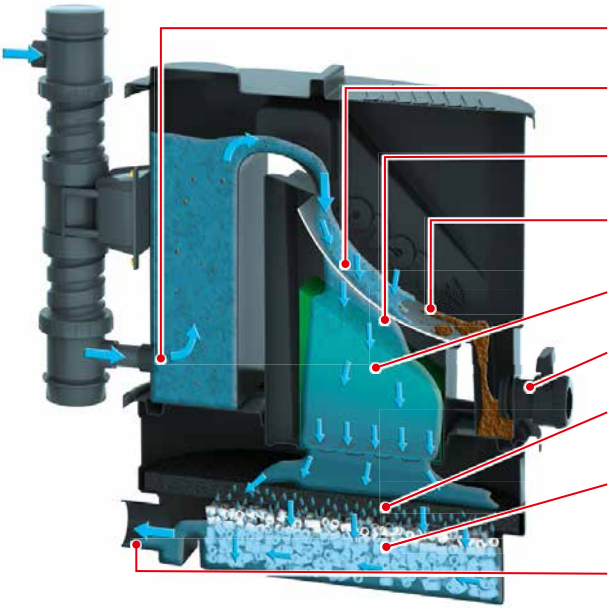
sera pond fil bioactive

- ✓ suitable for operating brooks
- ✓ can be dug into the ground up to the lid
- ✓ backwashing for easy intermediate cleaning
- ✓ automatic pollution display for backwashing or cleaning
- ✓ tightly locked due to locking ring between lid and body
- ✓ Filter camber with 4 sponges in a row for stepwise filtration

Flow-through filters

A flow-through filter has the advantage that the water is strongly enriched with oxygen due to the special array of split sieves and filter mats. This is necessary especially during summer and in case of dense stock with animals and plants. Flow-through filters usually provide a larger chamber for biological filtration, they therefore allow for even more surface. Flow-through filters make sense especially in case of pond sizes above 10,000 liters (2,642 US gal.).

sera KOI Professional 12000 / 24000 Pond Filter



Innovative compact filter systems for all ponds

- ✓ low maintenance, space saving filters with multiple efficiency for clear water in ponds
- ✓ **sera pond UV-C System 55 W** (included with the **sera KOI Professional 12000 Pond Filter**) for effectively removing bacteria and floating algae
- ✓ split sieve technology for permanent removal of floating particles up to a size of 200 µm and oxygen enrichment
- ✓ fine mesh sponges for removing floating algae and cloudiness
- ✓ biochamber including matala mat and **sera siporax pond** for cleaning the water biologically

Further advantages:

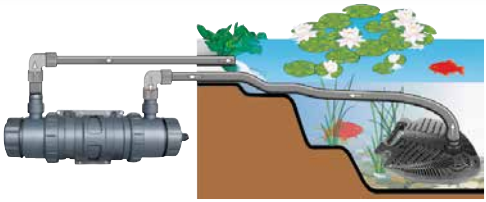
- ✓ low phosphate and nitrate levels due to quick removal of dirt and waste particles
- ✓ easy installation and little maintenance effort
- ✓ suitable for ponds up to 20,000 liters (5,284 US gal.) water volume and Koi ponds up to 12,000 liters (3,170 US gal.) (**sera KOI Professional 12000**), or for ponds up to 40,000 liters (10,568 US gal.) water volume and Koi ponds up to 24,000 liters (6,340 US gal.) (**sera KOI Professional 24000**)

Filter technology

UV-C Clarification

Originally used in the preparation of drinking water, this water purification technology now also became established for ponds during the last years. The expression "UV" refers to light of a certain wavelength –so-called ultraviolet light C. UV-C light has the positive effect that algae, pathogens and mold cannot multiply any more. Furthermore, algae cells clog when being exposed to UV-C, which considerably simplifies removing the dead algae by a filter. This technology provides a successful way to treat green water without using any chemicals.

All **sera** pond filters can be operated in combination with the **sera pond UV-C System 55 W**. This unit is even included with the **sera KOI Professional 12000 Pond Filter**.



Pond pumps

A pond pump is required for operating both filter types. Pumps from the **sera pond PP range** are particularly well suited for this purpose. The required performance depends on the pond volume and the required feed height.

The pumps from the **sera pond SP range** are suited for small filter systems or for operating water displays. They are easy to install in the pond, and due to different nozzles you may choose which water display suits your pond best.

Life in a pond

A pond would of course not be a pond without fish and plants that make it live.

Goldfish and Koi are probably the best known fish in our ponds. However, there are also other fish that are excellently suited for keeping in ponds. Some even fulfill special tasks as they eat annoying mosquito larvae so you can enjoy a mosquito free time out in the green during summer.

Goldfish (*Carassius auratus*)
(up to 30 cm/12 in.)
The most classic pond fish is easy to keep. Goldfish love sunlight. Better add only 3 – 5 specimens as they multiply rapidly.

Sunbleak (*Leucaspius delineatus*)
(8 – 10 cm/3.2 – 4 in.)
These small, vivid shoal fish like to dwell in densely planted bank zones. They love to eat small crustaceans, insects and larvae.

Shubunkin
(*Carassius auratus* var. *shubunkin*)
Shubunkins are a goldfish variant. They have black spots on top of a bluish and orange blotched basic color. The requirements are the same as for normal goldfish.

Golden orfe (*Leuciscus idus*)
(25 – 80 cm/10 in. – 2.6 ft.)
These fish also live in shoals. They require plenty of space and oxygen. Additional aeration is therefore recommended. 7 – 12 of these agile fish will keep a pond sized 6 m² (65 sq. ft.) free from mosquitoes.

Life in a pond

Bitterlings (*Rhodeus amarus*)
(6 – 8 cm/2.4 – 3.2 in.)
These cyprinids are difficult to breed as the female requires river mussels or painter's mussels for laying her eggs. Due to their small size they are especially suitable for small ponds.

Sterlets (*Acipenser ruthenus*)
(up to 100 cm/3.3 ft.)
Being bottom oriented fish, they mainly spend their days and nights above the bottom gravel and dig for worms, snails and crustaceans in the mud.

Golden tenches (*Tinca tinca*)
(25 – 30 cm/10 – 12 in.)
The calm and easy-to-keep golden tenches are very useful fish. They clean the bottom from uneaten food etc. Aquatic snails are their favorite food. However, they can be observed in the shallow zones only at dusk or when being fed.

Gudgeons (*Gobio gobio*)
(up to 20 cm/8 in.)
These bottom-orientated shoal fish grow slowly and hardly ever reach 20 cm (8 in.) in length. Gudgeons feed on bottom dwelling invertebrates.

Feeding fish correctly

Fish will find edible things in a natural pond. Feeding, however, is nevertheless required. Their feeding habits and the requirements of the fish according to the seasons must be considered. **sera** provides your fish high quality and natural variation with plenty of vitamins, minerals, trace elements and herbs in a varied food range. **sera** food ensures healthy growth, liveliness and splendid colors.

The basic rule is to use only high quality food. It can be utilized by the animals almost entirely. Poor quality food is excreted almost undigested and thus provides an excellent basis for algae.

Feeding in case of mixed fish stock

The food types **sera pond flakes** (for small and medium sized fish up to approx. 8 cm/3.1 in.), **sera pond granulat** (for medium sized and large fish above 8 cm/3.1 in.), **sera pond color sticks** for a splendid coloration and **sera pond mix royal** – a food blend containing a suitable treat for every fish – are particularly well suited in this case.

Feeding fish correctly

Feeding goldfish

You will have to try which food your goldfish like best. Some are very tame and come up to the water surface for feeding. You can excellently watch them eating when feeding the floating **sera goldy** flake food. In case the fish are somewhat shy, they should be fed the slowly sinking **sera goldy gran**. Feed with **sera goldy color spirulina** in an alternating way for enhancing the splendid coloration.

Feeding sturgeons

sera pond Sturgeon Granules was developed for directed feeding of the impressive sterlets in ponds. The sinking granulated food keeps its shape in the water for a long time and does not cloud the water. It therefore meets the feeding habits of the bottom orientated sturgeons.

Disease outbreaks in a pond can not always be avoided even in case of best possible care. The **sera guide** *"Healthy pond fish" therefore deals with this very extensive topic and the correct treatment.*

Feeding Koi

sera lets you choose from two product ranges for feeding these royal pond fish. The basic range palette includes **sera KOI ROYAL**, the basic food available in different sizes, **sera KOI COLOR** for enhancing the splendid coloration and **sera KOI NATURE**, dried silk worm pupae as a special treat.

A tip:
A regular vitamin treatment with **sera KOI MULTIVITAMIN** *strengthens the immune system of the fish and thus prevents diseases. Simply pour the required amount onto a few food flakes and feed to do so.*

sera KOI SNACK allows for a very special kind of feeding. These unique food sticks make your Koi quickly become familiar with hand feeding and allow you unique contact with your animal.

The **sera KOI Professional range** allows feeding like professionals and breeders do. The unique co-extrusion method especially developed for this purpose allows combining food blends optimized to the corresponding season on the one hand, and a core that optimally protects the included vitamins due to a special low temperature process.

Feeding fish correctly

The innovation by the sera research department: sera KOI Professional – the first co-extruded food

The **sera** research department has developed a unique food, **sera KOI Professional**, which exactly matches the nutritional requirements of the Koi considering size, temperature and season.

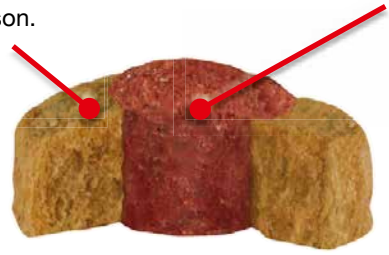
The natural high quality food ingredients are processed by different methods in a way that no valuable ingredients are being lost. Comparable to human food, there are also ingredients in Koi food that need to be processed gently at low temperatures, and ingredients whose full effects only unfold at higher temperatures.

The co-extrusion method allows combining the separately manufactured ingredients into one food consisting of a ring and a core – specially developed to meet the requirements of Koi during the different seasons.

This ensures high digestibility, low water pollution and, correspondingly, low maintenance effort of the pond during the different seasons.

Ring

Food mixture that Koi naturally need, optimized for the corresponding season.



Core

Contains the **sera Vital Immune Protect Formula**, manufactured in the particularly gentle low temperature process. Rich in vitamins, natural minerals and trace elements. Strengthens disease resistance, thus reduces sensitivity towards diseases.

You will find detailed information about feeding Koi correctly in the brochure **“sera KOI Professional”**.

Spirulina Color Food

above 8°C (46°F)

Ring: high amount of Spirulina and Haematococcus algae for clear separation and silky gloss of the color zones. Prevents unsightly yellowing of the white pattern of the Koi.
Core: VIP Formula + particularly high amount of minerals and trace elements.

Spring/ Autumn Food

below 17°C (63°F)

Ring: particularly easily digestible ingredients relieve metabolism, ensure good conditioning and prepare safe hibernation.
Core: VIP Formula + particularly high amount of vitamin C.

Summer Food

above 17°C (63°F)

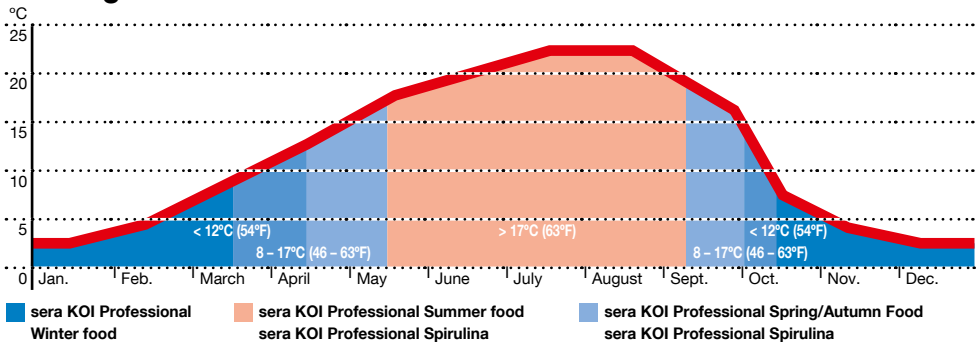
Ring: balanced ratio between energy and proteins ensures optimal digestibility and best possible growth along with minimum water pollution.
Core: VIP Formula + garlic

Winter Food

below 12°C (54°F)

With essential omega-3 fatty acids and reduced carbohydrate amounts for optimal health of your Koi during winter. Quickly sinks down to the bottom where the fish dwell during winter and look for food.

Feeding with sera KOI Professional:



Plants in a pond

Water plants are likely to be the most important part of a pond. Besides their beautiful appearance, they serve as a wastewater treatment system in the pond by consuming pollutants such as ammonium, ammonia, nitrate and phosphate. These substances can thus not harm the fish. Plants and unsightly algae are direct nutrient competitors, especially when competing for nitrate and phosphate. Healthy plants always are the winners, algae have no chance. Supplying the plants with nutrients and trace elements not present in the water is essential for healthy plant growth. The plants need to be fertilized regularly. Add **sera pond florena concentrate** directly to the pond water or place **sera pond florenette Tabs** at the plant roots (particularly suitable for new plants) to do so.

The best planting time

You can plant your pond from spring to the beginning of autumn. Due to the higher water temperature the plants will quickly grow on during this time. Submerged plants, floating leaf plants and plants with leaves above the water surface should be equally present in your pond. A general rule is: Submerged plants should make up a third of the total amount of the aquatic plant stock. Especially direct nutrient competitors for algae, such as reed mace or waterweed, should not be missing in any pond.

Submerged and, in particular, floating leaf plants are best put in plant baskets. First spread a planting mat in the baskets, fill them with coarse sand or gravel (never topsoil!) and fold the mat back to the inside.

Bank plants

Dwarf reed mace (*Typha minima*)
Growth height:
approx. 10 – 25 cm (4 – 10 in.)
Flowering time: July – August
A winter-green perennial. Needs to be cut back strongly in spring. Goes along well with swamp loosestrife and iris.

Iris (*Iris* sp.)
Growth height:
approx. 60 – 80 cm (2 – 2.6 ft.)
Flowering time: May – July
This plant is under nature protection in the wild.

Umbrella grass *(Cyperus alternifolius)*
Growth height: approx. 80 cm (2.6 ft.)
Flowering time: July – August
Suitable for acidic soil. Plant in loose groups or as a solitary plant. Do not cut back. Goes along well with reed mace.

Then cover the basket surface with stone to prevent the plant from getting loose. In the swamp zone you should fix the plants with a slope mat.

Swamp plants

Swamp loosestrife (*Lythrum salicaria*)
Growth height:
approx. 80 – 150 cm (2.6 – 5 ft.)
Flowering time: June – September
Cut back in spring, remove withered blooms. Can be propagated by cuttings in early summer.

When it comes to ponds, plants are categorized into bank plants, marsh plants, shallow water plants and deep water plants according to their preferred location.

Bog bean (*Menyanthes trifoliata*)
Growth height: up to 30 cm (12 in.)
Flowering time: May – June
Plant in a sunny place.

Water forget-me-not
(*Myosotis scorpioides*)
Growth height:
approx. 20 – 40 cm (8 – 16 in.)
Flowering time: May – October
Frugal, tends to spread. Goes along well with marsh marigold.

Marsh marigold (*Caltha palustris*)
Growth height:
approx. 20 – 30 cm (8 – 12 in.)
Flowering time: March – June
Easy to maintain, but should not be planted in a too shady place as otherwise long stems will be formed. Partially remove leaves in summer as to prevent mildew.

Plants in a pond

Shallow water plants

Water plantain (*Alisma* sp.)
Growth height:
approx. 60 – 80 cm (2 – 2.6 ft.)
Flowering time: June – August
Cut back regularly, especially in small ponds. Ideal for covering basin or liner edges.

Flowering rush (*Butomus umbellatus*)
Growth height: approx. 100 cm (3.3 ft.)
Flowering time: July – August
Trouble-free. Cut back in spring if it grows too abundantly. Attractive when planted in groups.

Deepwater plants

Bog arum (*Calla palustris*)
Growth height: up to 30 cm (12 in.)
Flowering time: May – July
Rootless rhizomes can also be freely put into the pond as floating plants.

Waterweed (*Elodea* sp.)
Growth height: up to 100 cm (3.3 ft.)
Water depth: up to 100 cm (3.3 ft.)
They grow rapidly and enrich the water with oxygen. Suitable for initial planting.

Water lilies

Water lilies are probably the best known and most popular floating leaf plants.

However, you should on the one hand make sure to choose a breed suitable for the pond size, as some kinds may become very large.

On the other hand, water lilies should not cover the entire water surface, as to prevent shading deepwater plants.

The pond year

As mentioned before, maintenance measures in a pond do not cause too much work if you observe some basic rules. Some seasonal aspects should also be considered when feeding the fish. Here you will find out how you can enjoy your pond throughout the year:

Spring

Spring is the time of the year in which you lay the foundation for a trouble free pond year. Careful pond maintenance in spring reduces necessary maintenance measures later on in the year. The “basic cleaning” is the biggest measure. Remove leaves and dead plant parts to do so. The sludge that gathered during the previous year must be removed from the bottom with a pond sludge remover. This prevents the formation of rotting sludge in this year. Afterwards, you should change about 1/3 of the pond water. Add **sera KOI PROTECT** and **sera pond bio nitrivec** to the water after you topped up the pond. Put the filter back into operation. **sera pond filter bio-start** is poured over the filter media so they will be settled by filter bacteria.

You should check the most important water parameters and adjust them if necessary (especially monitor the KH!).

Excess nutrients must be bound with **sera pond phosvec** as to prevent algae (please also see: “What to do against algae?”). **sera pond bio humin** (immediate help) additionally helps shading the pond by giving the water a clear, amber colored tint. This prevents algae growth, and the fish feel visibly well in crystal clear water.

For fish, spring is the most critical time in the pond. Temperatures that sometimes vary strongly between day and night lead to digestion stopping temporarily. It is therefore important to commence feeding with special, easily digestible food rich in vitamins.

The food types **sera KOI Professional Spring/Autumn Food**, **sera KOI Professional Spirulina Color Food**, **sera KOI ROYAL**, **sera goldy**, **sera goldy gran**, **sera goldy color spirulina** and **sera KOI NATURE** are in this case ideally suited.

A vitamin treatment with **sera KOI MULTIVITAMIN** strengthens the immune system and helps the fish get through spring healthily.

Besides checking the water parameters regularly, special attention should be paid to the filter in summer. It must be cleaned if the flow rate becomes lower. Pour **sera pond filter biostart** over the filter media after every cleaning. Plants require plenty of nutrients for their growth. You should therefore fertilize them regularly with **sera pond florena concentrate** or **sera pond florenette Tabs**. They will develop their full flower splendor only then. Furthermore, the KH sinks due to the high nutrient consumption. You should therefore regularly add **sera KH/pH-plus**.

Top up your pond regularly, but do not forget to always condition the water with **sera KOI PROTECT** and **sera pond bio nitrivec** according to the requirements of the fish.

The pond year

In case the visible depth is reduced by cloudiness, the annoying floating particles can be bound with **sera pond crystal** so the filter can collect them more easily.
The oxygen level of the water can go down quickly at high temperatures. A brook or a water display can counteract this. **sera O_2 plus** provides quick help in case of acute oxygen deficiencies, which can be recognized by fish breathing quickly just underneath the water surface.

Despite careful maintenance, spontaneous algae blooms may occur especially in early summer. You will read in the section “What to do against algae?” how to combat them.

Summer is the time when fish grow most strongly and are most active. During this time, they therefore need food particularly rich in nutrients, such as **sera KOI Professional Summer Food**, **sera KOI Professional Spirulina Color Food**, **sera KOI ROYAL**, **sera goldy**, **sera goldy gran** and **sera goldy color spirulina**.

You should prepare your pond for the winter in autumn. Cut back withered plants and remove leaves that were blown into the pond to do so.
The filter should be switched off and cleaned as well when temperatures permanently drop below 12°C (54°F).

The fish are being prepared for the winter by so-called “food conditioning” in late summer and autumn. As winter is the most difficult time for the fish, they must be prepared for the hibernation time at cold water temperatures with good food rich in nutrients, such as **sera KOI Professional Spring/Autumn Food** or **sera KOI Professional Spirulina Color Food**.

A tip:
Plants with hard stems, such as bulrush, allow gas exchange also when the pond is entirely covered with ice during the winter. They should therefore be cut back only in spring.

Winter

The temperature in the bottom water layer is constantly 4°C (39°F) in ponds with a minimum depth of 1 m (3.3 ft.), the temperature becomes lower closer to the surface. This temperature is sufficient for hibernating the fish. No additional heater is required. However, in a hard winter with lasting ice formation on the pond it may be necessary to keep a part of the pond free from ice as to ensure oxygen supply. Place a pond pump just underneath the water surface to do so. Please make by all means sure that the deeper and, accordingly, warmer water layers are not swirled up, otherwise there is danger of fish freezing to death. Breaking the ice layer or walking on it should also be avoided, as this disturbs the hibernating fish and in the worst case may lead to their death.

Below 12°C (54°F), you can feed them **sera KOI Professional Winter Food** if the animals still take up food.

What to do against algae?

Algae are always a component of healthy ponds and provide a necessary nutrient source for small organisms. However, uncontrolled multiplication may have severe consequences for the pond and the animals.

Algae are easy to avoid by the following measures:

Reduce sunlight

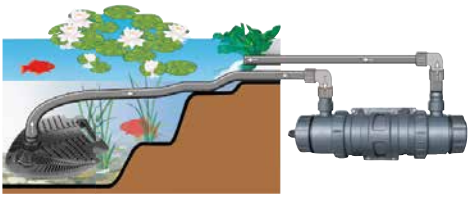
Algae love plenty of sunlight. The pond should therefore be partially shady. If this is not possible, it is easy to give the pond water a darker tint by using **sera pond bio humin**.

Maximize plants

Plants directly compete with algae. If they are healthy and grow strongly, algae have no basis for growing. Regular fertilization with **sera pond florena concentrate** and **sera pond florenette Tabs** supports strong plant growth.

Feed cleanly

High quality food is largely digested, fish waste does not pollute the water, no excess nutrients are made available for algae.



Purification technology

UV-C technology provides one of the best ways to prevent algae growth, especially if planting sufficiently is not possible or not desired (also see INFO: “UV-C Clarification”, p. 12).

Important:
The water needs to be stabilized before applying algae combating treatments. This is done with **sera pond bio balance***.*

Despite being very careful, strong algae multiplication may occur under unfavorable circumstances. It is now important to act quickly, before animals are being harmed or the water “collapses” and cannot be saved any more.
Two different kinds of annoying algae mainly occur in ponds:

Thread algae

Thread algae mainly grow on rocks and plants, especially in the bank zone. **sera pond algokill*** is immediately effective against unsightly thread algae in ponds. Thread algae are permanently destroyed by releasing active oxygen. Furthermore, oxygen deficiency caused by dying algae in the pond is compensated by **sera pond algokill***. **sera pond algokill*** is sprinkled directly onto the algae mats. The product then immediately and effectively becomes active at the problem location.

A tip:
After a treatment, dead algae remainders should be removed from the pond manually or by means of a fine mesh filter medium, as they may release nutrients while decomposing. Excess nutrients should therefore by all means be bound with **sera pond phosvec** *after an algae treatment.*

Floating algae

Floating algae are visible as green water. The highly effective **sera pond algenstop*** provides help in this case. Due to the specific composition, **sera pond algenstop*** unfolds its effect over a long period of approx. 1 to 6 weeks. You can therefore control the algae growth in ponds for a long time by using **sera pond algenstop***.

You can combat algae very easily and, even more important, lastingly with the special **sera pond algovec Kits**. Including the **sera kH-test**, **sera pond bio balance** and the corresponding algae combating treatments, the kits contain everything you need in case of acute algae growth. Since quick help is often required in case of algae infestation, it is advisable to always keep an according kit at home.

* Use biocides safely. Always read the label and product information before use.

What to do against algae?

Algae prevention

General measures		how sera helps
Reduce sunlight	build pond in a partially shady location	**sera pond bio humin**
Nutrient competition	strong plant growth	**sera pond florenette Tabs, sera pond florena concentrate**
Feed high quality food	use only high quality food, only as much as the animals take up in a short time	e.g. **sera KOI Professional Spirulina Color Food**, **Spring/Autumn Food**, **Summer Food** and **Winter Food**
Limit nutrients & remove cloudiness	regularly remove plant and food remainders, adjust filter performance to the pond size, establish biological filtration	**sera pond phosvec, sera pond crystal, sera pond filter biostart** **sera pond filters: sera pond fil bioactive, sera KOI Professional 12000/24000**

Stabilize and check pond water

General measures	how sera helps
Condition water according to nature	**sera KOI PROTECT**, **sera pond bio nitrivec**, **sera O_2 plus**
Stabilize water	**sera pond bio balance**
Check water parameters regularly	**sera water test kits**

Combat algae

General measures	how sera helps
Thread algae	**sera pond algokill***, **sera pond algovec Kit 1**
Floating algae	**sera pond algenstop***, **sera pond algovec Kit 2**

* Use biocides safely. Always read the label and product information before use.

The unique combination: Prevention and combating

General measures	how sera helps
Thread algae & floating algae	**sera UV-C System 24 / 55 W, sera KOI Professional 12000 Pond Filter**

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