

rapitest Pond Test Kit INSTRUCTIONS

WHY TEST YOUR POND?

The quality of pond water is vital to ensure healthy fish and plant life. Poor water conditions cause fish to lose their color, behave unnaturally and become prone to disease. Plants will also discolor and show signs of stunted growth.

Pond water should always be tested before fish are introduced and regularly monitored throughout the year. Any changes in water conditions can therefore be quickly identified and remedied.

ABOUT pH (ACIDITY AND ALKALINITY)

pH is a way of expressing whether water is acid, alkaline or neutral. It is measured on a scale from 0-14, with pH 7 being the neutral point. Any level below pH 7 is acid and any level above pH 7 is alkaline.

Pond fish prefer a pH range of 7.0 to 8.5, although they will survive in slightly acid conditions. Below pH 6.5, fish will show signs of irritation and discoloration. At extreme pH levels, fish and plants will not survive.

ABOUT AMMONIA, NITRITES (TOXIC POLLUTANTS), AND NITRATES

The decomposition of fish waste, uneaten food and decomposing plant material is a process referred to as the Nitrogen cycle.

The first stage of the breakdown results in the formation of toxic ammonia and relatively non-toxic ammonium. Both are easily converted into each other depending upon the pH, i.e. above pH 8.5 - ammonia (toxic); below pH 7.5 - ammonium (non-toxic). Toxic pollutant levels are measured in milligrams per litre (mg/l).

The maximum level of free ammonia that fish can tolerate is 0.2 mg/litre: an ammonia concentration in excess of 0.2 mg/litre is lethal. In an established pond, the ammonia concentration should rarely exceed 0 mg/litre.

A high level of ammonia will severely effect the respiratory system, i.e. rapid gill movements and gasping at the surface. The skin will also be irritated with fish rubbing themselves against underwater objects.

The second stage of the breakdown results in the formulation of nitrite. Nitrite is less toxic than ammonia but the level should not exceed 0.25 mg/ litre. A nitrite concentration in excess of 5 mg/litre is lethal; above 0.5 mg/litre fish will be adversely affected.

Nitrite poisoning symptoms are listlessness, oxygen starvation and discoloration of the skin.

The third stage of the breakdown results in the formation of nitrate. Nitrate is less harmful to fish than ammonia and nitrite. Its lowest limit of lethal toxicity is 50-200 mg/litre.

In ponds, nitrates are consumed by plants and algae as food. As a result it promotes plant growth, but excess levels can lead to an undesirable growth of algae.

High concentrations of nitrate, in excess of 50 mg/litre, can be harmful to fish and cause unsightly algae growth. Suspended algae or blanket weed can become troublesome if high nitrate levels persist.

WHEN TO TEST YOUR POND

pH: The pH of pond water is constantly changing due to rainfall, evaporation, photosynthesis and can be dramatically affected by partial water changes either as a treatment or if ground water is allowed to drain into the pond.

Pond water should be tested every 2 weeks from the beginning of April to the end of September and periodically during the winter period. If the season is extended by warm weather, you should tailor your testing accordingly.

Always test the pH of your tap water and compare it with the pH of pond water before adding water, to ensure the levels are similar. Also, periodically test the pH of your rainwater to compensate for the effects of acid rain.

As pH levels can vary from day to night (due to photosynthesis and respiration), it is advisable to test the pH during the afternoon when the pond normally reaches equilibrium.

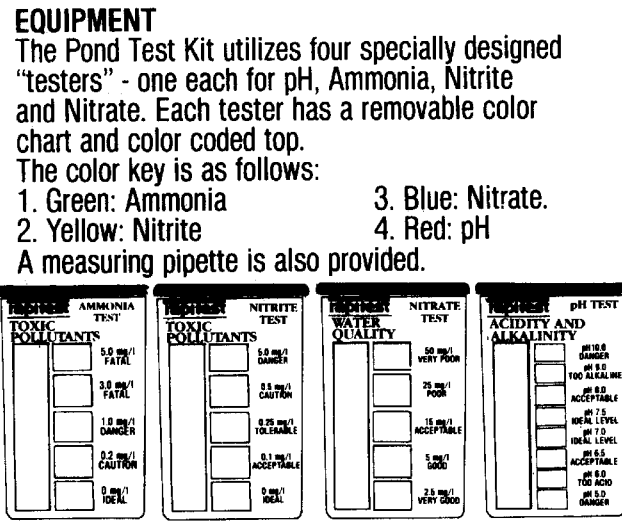
Ammonia, Nitrite and Nitrate

Ammonia and Nitrite levels should be monitored at least every two weeks between May and September and periodically during the winter season, especially when the pond is iced over. This ensures that if harmful levels are detected corrective action can be taken before fish become adversely affected.

Nitrate levels reflect the balance between plant life and the number of fish in the pond. If the balance is in equilibrium, the nitrate concentrate will be low. If there are no plants, the pond is overstocked or the fish are overfed, the nitrate level will rise. Test at least every 3 to 4 weeks as standard practice.

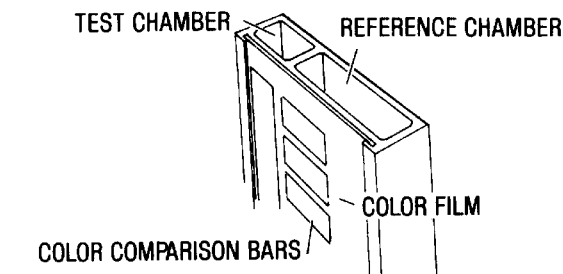
If there is no evidence of rapid growth in suspended algae, you should test more frequently to monitor the nitrate level. Also if an ultraviolet sterilizing unit is used to maintain clear water in a plant free pond, nitrate levels should be tested more frequently.

Although Ammonia and Nitrite levels rarely vary between day and night, it is advisable to test both levels at the same time you are testing for pH due to the important relationship between ammonia/ammonium and pH.



MAKING YOUR POND TESTS

- Select the appropriate tester according to the test you wish to conduct (refer to the color codes). Remove the cap and take out the capsules which are also coded in the appropriate color. Make sure the color chart is in place. Avoid interchanging color charts between testers.
- Rinse the Test and Reference chambers with pond water. Fill both chambers with pond water to the level marks on the color chart. The water should be at room temperature for best results. Use the pipette provided.



NOTE: The Ammonia test contains 2 packets of capsules color-coded light and dark green. One capsule from each packet is required for the test. Remove the capsules and empty both into the test chamber, following directions in steps 3 thru 7. All other tests require only one capsule.

- Take one of the capsules and holding it vertically with the lid pointing upwards, gently tap the bottom of the capsule against a hard surface to settle the contents. Carefully open the capsule over the test chamber by twisting the two halves apart. Pour the powder into the test chamber.

- Fit the cap onto the tester making sure the individual seals are properly seated. Shake thoroughly until the powder is completely dispersed.

- Allow the color to develop in the test chamber for about five minutes for pH, Nitrate and Nitrite tests. Allow 30 minutes for color development on the Ammonia test.
- Compare the colored solution in the test chamber with the color chart alongside. Select the colors against a white background (1" away) using natural daylight (with the light source from the side). Avoid direct sunlight. Judge in-between colors, if necessary.

- Read off your results and write them down.

RECOMMENDATIONS

pH can be affected by many factors: day/night fluctuations, untreated cement lining, rainfall, ground water, excess debris, etc. The cause of a pH problem needs to be determined and any subsequent change to the pH level should be gradual.

Ammonia and Nitrite, on the other hand, are toxic pollutants therefore it is essential to remove the toxin immediately.

pH ADJUSTMENTS

pH LEVEL	WATER CONDITIONS	ADJUSTMENTS
pH 9 to 10 VERY ALKALINE	Dangerous: Excessive Alkalinity, harmful to pond life.	Emergency Action. Reduce Alkalinity
pH 8.5* ALKALINE	Poor: Too alkaline for most pond fish.	Immediate Action. Reduce Alkalinity
pH 8 ALKALINE	Acceptable: Tolerable level for most pond fish.	Action: Monitor the pH value to prevent high Alkalinity
pH 7.5 SLIGHTLY ALKALINE	Ideal: Common Karp Koi	Action: Monitor the pH value to ensure a constant level.
pH 7.0 NEUTRAL	Good: Goldfish	
pH 6.5 SLIGHTLY ACID	Acceptable: Tolerable level for most pond fish.	Action: Monitor the pH value to prevent high acidity.
pH 6 ACID	Poor: Too acidic for most pond fish.	Immediate Action. Reduce Acidity.
pH 5 VERY ACID	Dangerous: Excessive Acidity. Harmful to pond life.	Emergency Action. Reduce Acidity

*Not on color chart.
Important: Adjustments to pH must be made gradually and not more than 0.5 pH per day.
Reducing Acidity and Alkalinity: In an emergency, change 25% of the water several times during a five day period. Before changing the water, it is advisable to test the pH of tapwater and compare the value with the pH of the pond water. If the pH levels are widely different, only change 10% of the water so that the pH change in the pond is minimized, as sudden changes in the pH can severely affect the fish.

Alternatively, use a proprietary pH adjuster and follow the manufacturer's recommendations.
Important: If you use tap water, it should be treated with a chemical preparation first to remove chlorine and chloramine. Always check ground water for nitrates as high levels can be harmful.

In most instances, a change in the pH level is caused by external factors and removing the offending article will normally overcome the need for a water change or chemical adjustment.

CAUSES OF HIGH ALKALINITY

CAUSES OF HIGH ALKALINITY	ACTION
Alkaline tapwater	Treat with acidic pH adjuster or dilute with rainwater
Water run off/groundwater	Divert drainage
Calcium laden material in pond or filter, e.g. limestone, decorative shell	Substitute with inert material
Carbon dioxide takeup by dense algae	Treat with anti-algae chemicals

CAUSES OF HIGH ACIDITY

CAUSES OF HIGH ACIDITY	ACTION
Acidic tapwater	Treat with alkaline pH adjuster or use calcium laden materials
Acid rainwater/groundwater	Divert drainage
Excess organic debris e.g. leaves, decaying plant matter	Remove the material
Overstocking	Reduce the number of fish
Inefficient filter	Clean filter regularly

REMOVING AMMONIA, NITRITES AND NITRATES

AMMONIA LEVEL	WATER CONDITIONS	ADJUSTMENTS
3-5 mg/l FATAL	Fatal: Lethal to pond life	Emergency Action. Reduce Ammonia level
1.0 mg/l DANGER	Dangerous: Toxic to pond fish	Emergency Action. Reduce Ammonia level
0.2 mg/l CAUTION	Critical: Absolute tolerable limit	Action. Remove Ammonia
0 mg/l IDEAL	Ideal for Karp, Koi, Goldfish	Action. Monitor Ammonia level to maintain 0 mg/litre

NITRITE LEVEL	WATER CONDITIONS	ADJUSTMENTS
5 mg/litre DANGER	Dangerous: Toxic to pond life.	Emergency action. Reduce Nitrite level
0.5 mg/litre CAUTION	Critical: Excess Nitrite, harmful to pond fish	Action. Reduce Nitrite level
0.25 mg/litre TOLERABLE	Tolerable: Absolute limit; fish may be adversely affected	Action. Remove Nitrite
0.1 mg/litre ACCEPTABLE	Acceptable: Traces of Nitrite suggest potential problems	Action. Monitor Nitrite value to prevent higher level
0 mg/litre IDEAL	Ideal for Karp, Koi, Goldfish	Action. Monitor Nitrite level to maintain 0 mg/litre

Reducing Ammonia and Nitrite Levels: In an emergency, change 25% of the water several times during a five day period to reduce the toxicity. Test the ammonia and nitrite concentrations and continue the water changes until the values have reduced to an acceptable level. Remember to test the pH of the water and beware of chlorine in the tapwater.

Remove as much debris as possible - decomposing plants and leaves, uneaten food, etc. Check the biological filter and clean it out, if necessary.

If there is evidence of overfeeding, review your feeding regime, i.e. feed only 2 or 3 times a day and in immediately consumable amounts. Make sure that pond is also not overstocked.

New ponds are particularly susceptible to a rapid buildup in toxic pollutants as the biological system has not "matured". Proprietary preparations are available to counteract high levels of Ammonia and Nitrite and these should be used strictly in accordance with the manufacturer's directions.

NITRATE LEVEL	WATER CONDITIONS	ADJUSTMENTS
50 mg/litre VERY POOR	Very Poor: Potentially harmful to fish and plant life. Algae problems	Action. Reduce Nitrate level
25 mg/litre POOR	Poor: Tolerable level for fish and plant life. Algae problems	Action. Reduce Nitrate level
15 mg/litre ACCEPTABLE	Acceptable: Good conditions for fish. Potential algae problem	Action. Monitor Nitrate value to prevent higher level
5 mg/litre GOOD	Good: Ideal level for fish and plant life	Action. Monitor Nitrate value to maintain constant water purity
2.5 mg/litre VERY GOOD	Very Good	Action. Monitor Nitrate value to maintain constant water purity

If the nitrate concentration is particularly high, change 25% of the water several times during a five day period to reduce the level. Remember to check the tap water to make sure the nitrate level is lower than the concentration in the pond. Remove debris from the pond and clean the filters. Overfeeding and overstocking can also contribute to a Nitrate problem.

Introduce oxygenating plants and promote rapid growth. In koi ponds, where plants are kept to a minimum, use a vegetable filter to encourage oxygenation.

Safety & Hygiene

Dispose of test solution by rinsing down the sink. Empty gelatin capsules should be disposed of immediately with household waste. Remove the color chart. Wash the tester and cap in warm, soapy water immediately after each use. Make sure any sediment or color staining is removed. Rinse well and dry. Replace the color chart on the tester. The bag of capsules should be stored inside the tester. Fit the cap on the tester and make sure the color chart is in place. Replace all components back into the package. The blister pack has been specially designed to be reused as a storage container. Store your kit in clean, dry conditions indoors.

The powder is safe in normal domestic terms, but like all chemicals and pharmaceuticals, capsules should be put away and kept out of reach of children. Try to avoid touching the powder. Always wash your hands thoroughly after making your tests. Do not eat, drink or smoke while using the test kit. Keep powder away from food, drink and animal feed. If taken internally, drink copious amounts of water and seek medical advice.

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