

See our web site for details....

[www.aquaponics.NET.au](http://www.aquaponics.NET.au)

Team Economics Pty Ltd  
21—31 Hives Road

[murray@aquaponics.NET.au](mailto:murray@aquaponics.NET.au)

Call us on **07 3200 0272**



## Adjusting pH in Aquaponics systems - How to...

Ideally, in an AP system the pH should be in a range from 6.8 to 7.2. It is not uncommon for the pH in a new system to be at 7.5 or even higher.

Adjusting pH in your Aquaponics system needs to be done in small increments. Large or rapid changes can be detrimental to your fish health and in some cases lead to fish deaths.

Very low pH, say 5.5 can be very detrimental to the health of your fish. Fish have a mucous all over their body which is part of their health defense system. In low pH conditions this protective membrane can be damaged or destroyed. This will result in sick or dead fish. I view a pH of 6.0 as the very lower limit for my systems. Ideally I try to keep the pH in the range of 6.6 to 7.2.

In a mature Aquaponics system the pH tends to drift down over time. This is as a result of the acid by product of the action of the beneficial bacteria in the AP system. It is a natural part of the process. Therefore expect pH to gradually move down.

I have observed pH to drop from 6.8 down to 5.8 in less than a month due to this natural process.

If your new system reads at, say, 7.5 or higher, then perhaps a little help to bring the pH down would be in order.

### Adjusting pH down.

The easiest and safest way is to use the juice of a lemon. It will depend on the total litres or gallons of water in your AP system as to how many lemons will be needed.

In a system of 1000 ltrs (250 gallons) the juice of half a lemon would be added initially. Wait for 24 hours then measure the pH. If a small fall is observed then repeat the process until you have the system down to just below 7.0 in the ideal range.

"Lemon Juice as a pH down adjuster."



I have also used Lemon Juice concentrate as shown in the photo above.

In my Patio Quad system there is a total of 1650 ltrs (425 gl approx) of water in the system.

I added 250 ml of the lemon concentrate per day for 4 days. This reduced the pH from 7.5 on day one to a reading of 6.8 on day 5. The system has drifted up a little to 7.0 on day 6, but appears to be holding at 7.0 for now.

As the system gets more age I expect to see the pH slowly come down further all by itself.

In the early stages of an Aquaponics system the pH can sometimes be elevated and difficult to bring down. I have used very small amounts of Hydrochloric acid to adjust downwards. It can be purchased from hardware stores for under 10.00 for 1 ltr. BE VERY CAREFUL HANDLING ACID. One CAP full at a time. Wait 24 hours and add more carrying out pH readings all the while. Remember slowly and easy does it.....pH adjustments should be done slowly. SEE NOTES NEXT PAGE.

### Adjusting pH upwards.

The tendency is for pH to continue to drift down so regular pH readings should be taken, say, once a week. AP systems tend to be low on 3 compounds, Iron, Calcium and Potassium.

It just so happens that Calcium and Potassium can be supplied to your system in the form of very convenient pH adjusters.

Builders Lime, known as Hydrated lime in some states, provides the Calcium and Eco Rose, a product sold as an organic mildew control, provides the Potassium in the form of Potassium Bicarbonate.

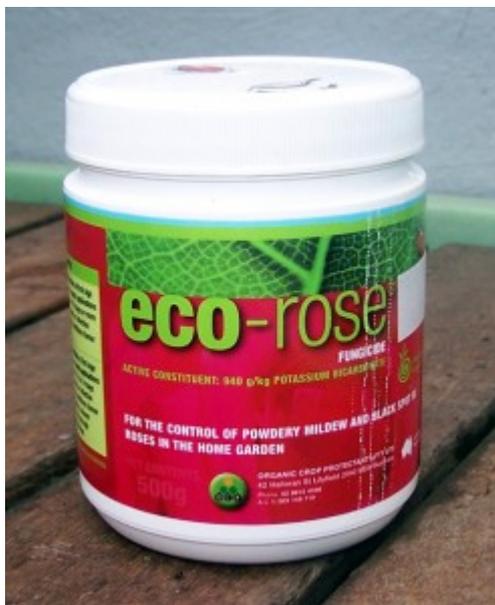
Used alternatively they will assist in not only adjusting the pH upwards, but provide much needed mineral to the system.

In a 1000 ltr system I use one table spoon of Hydrated lime dissolved in water for one treatment, and on the next treatment one table spoon of Eco Rose dissolved in water.

Pour the dissolved mixture into the grow bed and allow it to circulate throughout your AP system. Next day take a pH reading to assess the result. Re treat if necessary.

Remember, make adjustments over time. Do not go all out with one heavy treatment.

"Typical bag of Hydrated Lime as available at most hardware stores."



Eco Rose. A product that is available at most gardening shops and is a great source of Potassium for your AP system."

It is also very useful spray on cucumbers to control Powdery Mildew

See next page for chemical analysis of Hydrated Lime.

NOTES: - If you choose to use hydraulic or phosphoric acid to bring pH down then be very careful. Use eye protection and wear gloves. Be careful not to inhale the fumes. Make sure there are no children nearby while you are handling the acid.

Phosphoric acid can be purchased from most Hydroponic stores

Att Murray

Sorry it took so long

TAMAREE

# TAMAREE LIMIL HYDRATED LIME

**Description:**

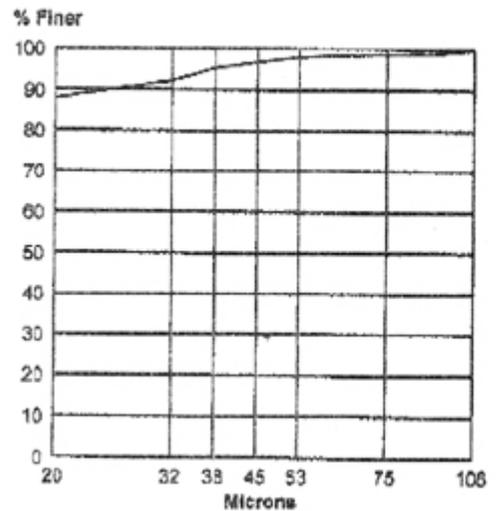
An off-white hydrated lime predominantly finer than 75 microns. Typically used for pH control in water/sewage treatment, gold and base metal mining, sugar processing, remediation works and in soil stabilisation, building mortar and asphalt. Produced at Tamaree, Queensland.

**Typical Chemical & Physical Properties:**

Total Calcium as	Ca(OH) <sub>2</sub>	94.7%
Magnesia	MgO	0.5%
Silica	SiO <sub>2</sub>	1.6%
Ferric Oxide	Fe <sub>2</sub> O <sub>3</sub>	0.1%
Alumina	Al <sub>2</sub> O <sub>3</sub>	0.2%
Loss on Ignition	(1000°C)	24.5%
Available Lime	CaO	72%
Specific Gravity		2.25
Bulk Density	(Compacted, kg/m <sup>3</sup> )	720

(Note: Typical properties are a consequence of the process, nature of raw material, and are measured at a low frequency. These results are an average of historical data. These results do not represent a specification)

**Typical Particle Size Distribution:**



**TEST METHODS:**

Particle Size UAL 2.5  
 Specific Gravity UAL 2.13 Ultracycrometer  
 Available Lime LD-OP-0164 Lydale Leo Manual

Chemical Analysis UAL 5.5 XRF  
 Loss on Ignition UAL 2.3  
 Bulk Density UAL 2.10(A) Autotapper

Date: JANUARY 2004  
 Issue No: 1  
 TIS No: 31 51  
 Authorised By: *Ruby [Signature]*