



## St. Augustine Orchid Society

[www.staugorchidsociety.org](http://www.staugorchidsociety.org)

### Are pH Checks Necessary?

by [Harry McElroy](mailto:cymbidiuman@msn.com), cymbidiuman@msn.com

An alternate title for this little article might be "Know What You Grow". My first inclination to check pH came after reading Bill Argo's five part series on plant nutrition that was first published in the magazine for the International Phalaenopsis Alliance. The articles appeared at the same time the MSU fertilizer came on the scene and this fertilizer was formulated by none other than Bill Argo.

**What Affects the Root Zone pH.** The pH of the potting mix inside your pot is important because if it is too low you can have micronutrient toxicity and if it is too high nutrients can become unavailable to your plant. The pH of your potting mix is determined by several factors:

- ★ The alkalinity of your raw water has a major impact on your root zone pH. Very alkaline water will tend to increase the root zone pH.
- ★ The fertilizer you use can impact your root zone pH. A good water test at a lab like J.R. Peters will tell you what you need to know and the cost of the test is worth the good recommendation about which fertilizer to use.
- ★ Your potting mix will impact your root zone pH. Sphagnum moss mixes tend to be very acidic with a pH in the 4 to 5 range. I put cymbidiums in sphagnum moss when they first come out of the flask. I use gypsum to buffer the acidic qualities of the moss. Organic materials like bark and coconut husk will degrade over time and this degradation will result in a decrease in the soil zone pH. Inert materials like hydroton and stalite will not lower root zone pH due to decomposition but may collect certain fertilizer salts over time if not properly flushed out.
- ★ Certain supplements will alter your root zone pH. The often used dolomitic lime used to increase available calcium and magnesium will result in an increase of pH.

**pH Testing Tools.** There are a variety of tools available to measure pH. Most expensive and precise is a pH meter. There are colorimetric test kits available from hydroponic stores for a fraction of the cost that will provide more precise results over a wide range of pH values. The cheapest and least precise are pH test strips, although the strips will give you accurate enough information to make decisions about your potting mix.

**Obtaining a Soil Zone Water Sample.** Place your orchid pot in a plastic bag and add water until 3/4 of the pot is full of water. Let the pot stand in the water for about an hour, then remove the bag. Catch a sample of the water draining from the pot.

**Good Levels and Bad Levels.** There is no absolute rule for what pH value is desirable in the root zone. Bill Argo suggests that a pH value of between 5.8 and 6.2 is probably suitable for most plants. There are some that like more acidic conditions and I find my cymbidiums are happy in the pH range of 6 to 7.

**Things I Learned from Testing Potting Mix pH.** Here are some of the things I have learned from my testing program:



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- ★ Substrate pH can be variable in the pots that are kept outside in the rain. During rainy periods, pH was in the desired range of 6 to 7 because the rainwater tends to be somewhat acidic. The pH tended to soar when well water was used in conjunction with dolomitic lime.
- ★ Cymbidiums require copious amounts of calcium, perhaps twice as much as cattleyas. I was using dolomitic lime which is composed of calcium carbonate and magnesium carbonate to provide the necessary calcium. Lime is a very alkaline material and it was causing the pH in my potting mix to reach levels of 7 to 8 when well water was used. This is too high. It was necessary to find a way to supply the supplemental calcium and magnesium cymbidiums like without causing an alkaline reaction. Rather than just adding dolomitic lime, I mixed dolomitic lime with gypsum (calcium sulfate) and add a tablespoon to each gallon pot. This has proven to be an effective way to get the benefit of calcium and magnesium without causing the pH in the potting media to get too high.
- ★ A little bit of organic material helps with the buffering the pH of the substrate in the pot. Orchiata bark was selected because of its advertised long life and the experience of other cymbidium growers with whom I am in contact. How much or little this helps has yet to be determined but pH testing will help me make this determination.
- ★ The assumption that inert substrate does not need to be tested is wrong. Stalite holds 30% of its weight in water and the pH of that water will be a major determinant of the pH of the stalite substrate. In addition some fertilizer salts will be held by the stalite substrate. Washing out or leaching the potting material is just as necessary with stalite as with any other material. Rain does help leach excess salts.
- ★ The hydroponic stores also sell pH up and pH down solutions but I prefer the pH adjusters sold by J.R. Peters for raising or lowering the pH of the water and fertilizer to help bring the pot pH back in to the range of 6 to 7 which I prefer. A good fertilizer recommended by the lab that tests your water may also give you correct pH.

**Interesting Case History.** My collection contains two plants which are hybrids of the Cymbidium species suave. I read with interest a forum discussion by an Australian very knowledgeable about this type of Austrocymbidium. In its native habitat, Cym. suave grows on rotten stumps of hollow Eucalyptus Gum trees. It gets its nutrients and moisture from the rotten heartwood through roots that may penetrate up to 30 ft into the heart of the tree. The pH of this heartwood is said to be between pH 4 and 5 but is usually closer to 4. Cym. suave is said to be almost impossible to cultivate, only a few grow the species with success though their hybrids are desirable in plant breeding due to the flower count (up to 50) and heat tolerance. The few who have mastered cultivation of this plant, water it with half of a Vitamin C tablet in a liter of water or a liter of water with 5 mL of pineapple juice. Pots are topped with coffee grounds which have a pH of 4.5 and they fertilize the plant with Prostragen Acid Plant fertilizer that has a pH of 4.5.



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*Cymbidium suave*, photo courtesy of Doug Beckers

Knowledge of the plants you grow is important. My Cym. suave hybrids would probably last only a few days if I added lime/gypsum to their potting mix. Most plants are not so particular. Most will grow a little better when you control pH and some will grow a lot better. Then there are the few that will die quickly if pH is not controlled. pH checking will also help you spot your culture mistakes. My assumption that what would work for rainwater would also work for well water was completely wrong. pH checks gave me the answer to a mistake in culture.

Be careful with fertilizer advice. Usually people tell you what works for them but do they use the same water you do? To me, the pH check is simply "Due Diligence" and is usually worth the effort.