St. Augustine Orchid Society NEWSLETTER
May 2017
Volume 12 Issue #5

Club News

May 2 SAOS Meeting

by Janis Croft,
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Welcome and Thanks. President Bob Schimmel opened the meeting at 7:10 pm with 60 attendees. Bob thanked Jeanette Smith for organizing the refreshments with special thanks to Doriana for bringing in her delicious flan and Dottie Sullivan for baking her scrumptious brownies. He then reminded all to drop a dollar in the basket when you enjoy the refreshments. We welcomed five guests along with three new members, Donna Kelley and Terry and Phyllis Turkovich.

Our Sunshine Coordinator, Linda Stewart delivered free raffle tickets for those with birthdays in April and May. New exhibitors on the show table receive three free raffle tickets. Bob encouraged all to vote for their favorite orchid on the show table.

Club Business. The next Ace Repotting Clinic will be on May 6 from 9 am ti 1 pm.

Shows in Florida this Month (Click on names for details):
Tallahassee, May 6-7
Platinum Coast, May 5-6
Volusia, May 13-14
Redland Festival in Homestead, May 19-21

The new T-shirts are in and were available at the side table ($20 for S to XL, $25 for XXL) along with fertilizer and potting supplies. Email Sue Bottom (sbottom15@hotmail.com) if you need potting supplies, special quantities or different items and she will bring them to the next meeting for purchase.

Club librarian Penny Halyburton brought in a CD on Orchid Potting and announced that she will now have the AOS magazine available for loan. Remember to email Penny (librarian@staugorchidsociety.org) with your book/DVD your request and she will bring the item(s) to the next meeting.

Our AOS Representative, Suzanne Susko, noted that the April edition of the AOS Orchids magazine had an AOS awarded plant by Sue Bottom in it. She noted that Sue had a good article about the Purely Organic fertilizer in the May issue. She then encouraged all to subscribe to AOS using the trifold pamphlet at the Welcome Table and reminded each to note the SAOS as your local club. This extends our magazine subscription by a month each time we get a new member to sign up.

Show Table Review. Courtney Hackney again remarked that our Show Table could make a wonderful exhibit at any orchid show. He started by pointing out that it is the season for Vandas to start blooming. The lineage of the plants is apparent in the color and size of the flower. He also noted that the taxonomists have been busy lumping and splitting the vandaceous orchids so many of the previously named ascocentrums, ascocendas, neofinetias, etc. are now simply called vandas. He then pointed out the very small vandaceous Sarcochilus.

Many phalaenopsis were in full bloom on the table and Courtney noted the Phal. Cradle Song x Phal. aphrodite. This is a complex hybrid bred back onto a species to increase flower count. Sue Bottom's plant had five branches on one inflorescence. Other similar hybrids were a Phal. Shu Long Diamond and Sogo Yukidan both with many flowers. Courtney noted that when your phalaenopsis matures and has 4 to 5 pairs of leaves, you will have more inflorescences and flowers.

He next went to the mostly white Cattleya skinneri in albescens form with a lip that had just a bit of purple color. Other Cattleyas were the C. Joy Sokabe 'Shining', a standard size with its beautiful purple and deep, dark lip and the C. Ports of Paradise whose flowers open up green and then turn to chartreuse and have an extraordinary

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Club News

Upcoming Orchid Events

May

5-7 Platinum Coast Orchid Society Show
- Kiwanis Island Park Gymnasium

6 Repotting at Ace Hardware, 9 am til 1 pm
- 3050 US 1 S in St. Augustine
- Repotting and Plant Clinic

6-7 Tallahassee Orchid Society Show
- Doyle Conner Building

13-14 Volusia County Society Show
- Volusia County Fairgrounds

19-21 Redland International Orchid Festival
- Fruit and Spice Park, Homestead

June

3 SAOS at Ace Hardware, 9 am til 1 pm
- 3050 US 1 S in St. Augustine
- Repotting and Plant Clinic

6 SAOS Meeting, 7 pm
- Mark Reinke, Marble Branch Farms
- Decoding Dendrobiums

11 JOS Picnic
- 3611 Richmond St., Jax 32205

13 JOS Meeting, Topic TBA, 7 pm
- Steve Arthur, Steve Arthur Orchids

July

1 SAOS at Ace Hardware, 9 am til 1 pm
- 3050 US 1 S in St. Augustine
- Repotting and Plant Clinic

6 SAOS Meeting, 7 pm
Rescheduled to Thursday from July 4th
- Courtney Hackney and Sue Bottom
- What's Wrong with My Orchid?
- Send pictures of any problem plants to
- Sue to be included in the program

11 JOS Meeting, Topic TBA, 7 pm
- Speaker TBA

22 SAOS Program – Repotting Orchids 2 pm
- SE Branch of St. Johns County Library

August

1 SAOS Meeting, 7 pm
- George Hausermann, EFG Orchids
- Orchid Growing Basics

5 SAOS at Ace Hardware, 9 am til 1 pm
- 3050 US 1 S in St. Augustine
- Repotting and Plant Clinic

??? Seventh Annual Cattleya Symposium
Sponsored by Odom's Orchids
Indian River Research & Education Ctr
Fort Pierce

8 JOS Meeting, Topic TBA, 7 pm
- Speaker TBA

St. Augustine Orchid Society Organization

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fragrance. Courtney next pointed out the Enc. Orchid Jungle that loves to grow in our Florida conditions with very bright light. Another interesting plant was the terrestrial Epi. radicans which is naturally found in Central America by the roadside growing like a weed. Courtney has seen massive plants grown in pots.

Finally, he went to Maxillaria tenuifolia which he called the "beach weed" due to its fragrance that is reminiscence of suntan lotion. Others refer to this as the Coconut pie plant also due to its fragrance. Check out the photos of our show table examples at the end of the newsletter and on the SAOS website.

SAOS Program. Glenn Gross from Gross Orchids in Lakeland, FL gave a hands-on presentation on mounting orchids. He likes to mount his plants because it is the most natural and easy way to grow orchids. He has fewer bacterial and fungal problems and a decrease in insect issues. When he plans on mounting a particular plant, his primary goal is to make the orchid look and grow as it does in nature. All plants will eventually grow upright on your mount even if initially, their leaves are pointing in opposite directions.

Glenn prefers to use Cedar or Cypress wood mounts but also mentioned the following as being good wood to mount on: magnolia, orange or grapefruit and if you can legally obtain, mangrove trunks. He uses 14 gauge galvanized wire (commonly used as drop ceiling support wires) that he buys at the big box stores in the roofing section. He also uses ½" galvanized EMT pipe that works great as hangers in his growing area. After drilling a hole in a cypress slab, he inserted the wire and bent it up and around the extended wire. He then used a small piece of the EMT pipe and folded the top of the wire around that to make a hook and the hanger was finished.

Next, preparing the plant. First, he sterilized his tools with a propane torch. He had matched his plant to the cypress slab by estimating how the future growth will spread to its long-term growth size. The best time to mount a plant is when new growth and roots are just appearing and you want to mount that area of the plant as tightly to the slab as possible.

Then as the audience watched in horror and exclamatory cries, Glenn proceeded to cut off almost all of the apparently healthy roots, there was not a root left. He then reminded all of us that orchids are epiphytic which means that they derive their moisture and nutrients from the air, rain, and available detritus. Glenn assured us that all of his plants reroot in approximately 6 weeks. He then placed that plant on the mount and marked location dots for the ties that will hold the plant. He drilled the holes and placed a small amount of wet sphagnum moss as a cushion under the rhizome. While holding plant and moss in place, he then threaded his cable ties through the holes and pulled them slightly closed. Once he had the plant positioned and all the ties in place and latched, he then pulled the ties tightly closed and made sure the plant was secure and the new growth areas were snugly against the cedar slab. He then cut the excess extension of the ties.

Glenn encouraged all of us to experiment with different types of orchids. He enjoys mixing up various hybrids on the same mount. When repotting and dividing your plant, consider mounting one division and comparing its growth to the other potted division.

In an effort to accelerate root growth, he uses a product called Dip 'N Grow which is a liquid form of the rooting plant hormone. It is available from Growers Supply and designed to be a dipping product but to avoid cross contamination between plants, he uses it as a spray rather than a dip. He adds a small amount to his spray bottle and fills with water, something on the order of a 10:1 to 12:1 ratio and spritzes around the roots and the moss. Do not mix up too much at once because it has a short shelf life and the potency degrades after about 24 hours so mix up only the quantity that you will be using immediately.

He hangs his mount and starts watering the next day. When asked how he fertilizes the mounted orchids, he told us that he now only uses foliar applications that are best applied during the cool of the morning when the leaves are most receptive. His mixture for 1 gallon of spray is 1 tbsp KeyPlex 350 mixed with 1 tbsp 17-17-17 urea free fertilizer (or Cal Mag or 1/2 tbsp Potassium Nitrate), 1 tbsp Whitehouse White Vinegar, perhaps a very few drops of Super Thrive and a final a squirt of Dawn liquid dish washing soap as a surfactant. Then when his plants are bone dry, he sprays this concoction on his plants which is usually once a week. He believes that the roots take in the most fertilizer when they are dry. Glenn then took questions from the audience.

Meeting Conclusion. Sue Bottom announced the Member's Choice Award as Roberta Hicks' Enc. Orchid Jungle. Susan Smith and Robert Susko ran a lively raffle to close out the meeting. Thanks to the five women and Terry that stayed to move all the tables and chairs and clean up the room. We always appreciate it when folks go the extra mile and volunteer to help return the Watson conference room back to the way we found it before our meeting.

Thanks to Watson Realty and Jeanette Smith for the use of their meeting space at 3505 US 1 South

Club News

April Picnic and Orchid Swap

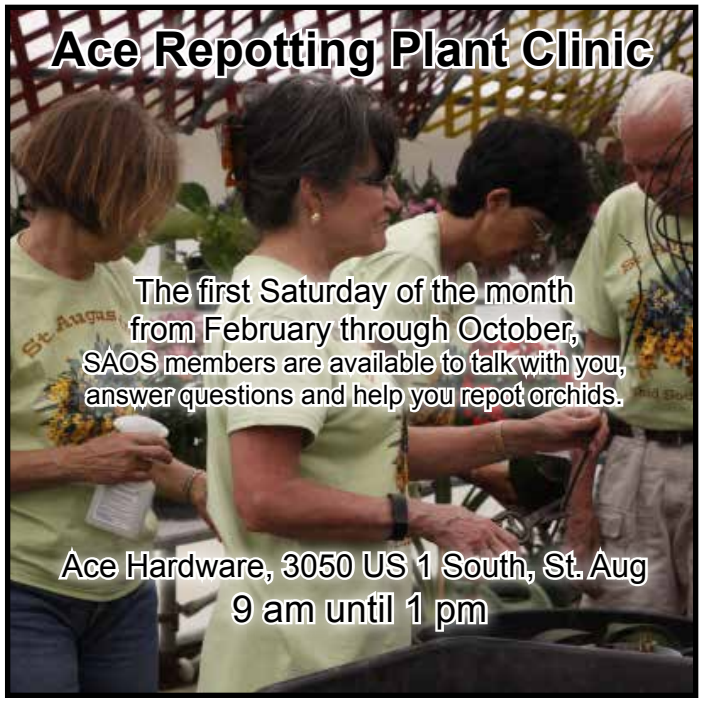
We had our second annual picnic and orchid swap at the Memorial Lutheran Church. About 40 members came to the picnic, many with orchids, orchid paraphernalia and other plants to trade, others with cash. Our Events Veep Dianne Batchelder organized the event, and made sure there were plenty of hamburgers and hotdogs for Bob Schimmel and Michael Rourke to grill. Members brought the side dishes, great salads, chips, sodas and many luscious desserts. We knew it was 5 o'clock somewhere, Miller time, and everyone enjoyed their favorite toddies. After several servings of food and some great camaraderie, Susan Smith gave a talk on how she grows her paphiopedilums and phragmipediums. She provided a handout of cultural guidelines for growing them. These beautiful and long lived bloomers are not seen too often on our show table, but maybe after Susan's talk that will change. There were lots of smiles and laughter at the picnic, a great time was had by all.

Keiki Club – Summer Vacation

We have a new plan for the Keiki Club get-togethers this year. We scheduled monthly meetings during the spring after our orchids roused from their winter rest. We talked about watering, fertilizing, repotting, and other growing issues. We finished up with the Picnic and Orchid Swap in April. Now it is time for our summer vacation. Keep watering and fertilizing your plants and watch for pest and disease issues. SAOS members will be available at the repotting clinics at Ace Hardware on the first Saturday of the month all summer long if you have any questions or problems. The Keiki Club will reconvene in September for a talk about fall preparations and the winter cold hardiness of different types of orchids. We'll have field trip opportunities to the Gainesville Orchid Society Show and EFG Orchtoberfest. Then it will be time for our orchids to rest while we celebrate the holidays!

June 6 Monthly SAOS Meeting
Decoding Dendrobiums

Mark Reinke of Marble Branch Farms in South Carolina will discuss Dendrobiums, those surprising orchids you thought you knew. Mark's program addresses the native climates and cultural needs of different Dendrobium sections. You will be pleasantly surprised by how many of these new introductions do well alongside your other orchids, offering long lasting, colorful blooms without the need for high heat, high light, or annual starving or chilling.

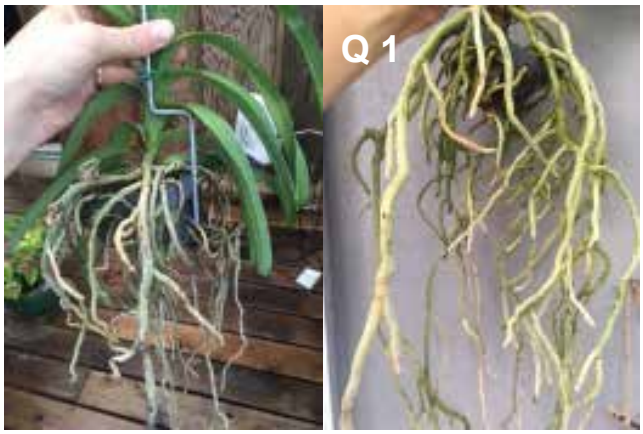


INSPIRATION

Orchid Questions & Answers

by Sue Bottom,
sbottom15@hotmail.com

Q1. I have a few vandas that have cracked roots and some that are very plump but yellowing. I am concerned this may be fusarium. I have treated with Switch already. I am hesitant to cut the stalk to check for the ring because I did that once and found no ring but ended up killing the vanda. Can you take a look at these roots and tell me it is a disease or just normal root death?



A1. I think your vandas look totally happy and fusarium is probably not an issue. If it were fusarium, it would be travelling up the stem and lower leaves would be infected and dropping, and that doesn't seem to be what's happening. More likely it is just the natural aging process. It is a sympodial orchid that is growing upward and adding several leaves each year, so the bottom stem slowly gets woody and the roots attached to the woody dying stem likewise perish, but their function is replaced by the roots that emerge higher up. I'm starting to see new rootlets on my vandas, it's that time of year. I cut away the nonviable roots as they are brought out in the spring, just to get the pleasure of seeing all the roots green up when watering and fertilizing.

Q2. I have had my own catastrophic event with my phalaenopsis this winter. I have hundreds of phals and thousands of phal seedlings growing in my basement that represent more than 20 years of hybridizing. During one cold night I left the window open and the plants directly in front of the window got chilled. About a one month latter the plants started getting yellow spots that progressed to sunken areas followed by leaf death.

The small necrotic spot at the center line of the leaf is frequently the first symptom usually at the base of the leaf. Sometimes I detect a very pale purple discoloration in the leaf that turns into a sunken spot on the underside of the leaf.

Thanks for your article on cold stress and secondary fusarium invaders. I clicked on the link you provided and looked at the control page for fungicides. The fungicide "Switch" you recommended did not get a positive rating in the chart. I am confused as to why you chose this. I have been trying Daconil and Physan 20 but I don't think they are preventing the spread. Can you suggest a drench for the whole pot?

A2. The Switch recommendation came from Hark Orchideen, a most excellent site to assist in the diagnosis and response to disease organisms. It was this site that led me to the Fusarium diagnosis after my heater failure. Their website says "In the case of Fusarium infestation at the base of the leaves, spraying with Cyprodinil + Fludioxonil (Switch) can be useful to stop it spreading in the stand and get the infestation under control." Their recommendation for the use of Switch is basically to stop the spread of Fusarium on the aerial parts of the plants, not to treat the basal or rooted portion. For drenches, Daconil, Heritage and Empress are highly rated.

I have about a dozen plants that looked like they survived the infection and the next winter began displaying the symptoms again, from which I can only conclude that Fusarium is incredibly difficult to eradicate. You may also have to get out the razor blades and cut away the severely infected tissue and then keep spraying and drenching.

Does Your Orchid Need to be Repotted?

Courtney's Orchid Growing Tips

May is one of the busiest months for orchid hobbyists. There is still time to repot, fertilize and attend to orchid pests.

"Should I repot this orchid?" is a common question. Repotting is most critical and often hard for new hobbyists because it takes a while to learn how to do it properly and it is hard to determine if the orchid should be repotted. The tendency is to want to repot, especially when there are roots going everywhere and a growth is at the edge of the pot. Orchids hate to be repotted, so repotting should only be done when absolutely necessary. Just because an orchid is coming out of the pot is not a reason to repot. Some types of orchids, e.g. dendrobiums prefer to be pot bound and go downhill for a year or two when given plenty of space in a new pot.

If you try to push a finger down into your orchid in a bark mix, is it difficult or does the medium yield easily? If it is relatively easy, the medium has degraded and you need to repot. If it is somewhere in between there may be a solution beyond repotting or not repotting. Hold the pot upside down being careful to hold the orchid itself in case the roots are not firmly attached to the pot. Use a jet of water and direct it at the top of the medium. Sometimes most of the degraded medium will flow from the pot leaving a mass of roots with just a few pieces of hard medium. If the roots are white and hard there is no need to remove the orchid. You can add medium, but do not damage roots as you work the new medium into the pot. I like to use puffed clay pebbles, which are round and easily flow into space between the roots without much effort.

If you do this and find mushy roots the orchid needs to be repotted. Remember that the longer the time between repotting, the more strength your orchid gets and the better the flowers will be next time. Roots are the key to good flowers and repotting removes the majority of them.

There are many orchids sold now in sphagnum. This is a soft medium that tends to stay moist. Typically, phalaenopsis are sold in this medium, but I have seen just about every orchid group sold in it. It is rare for sphagnum to last more than a year. If you can easily pull small pieces of medium from the pot when you purchase it, you likely need to repot the orchid as soon as it finishes flowering.

If you have a small collection, apply Nutricote now if you have not already done so. If you use a soluble fertilizer this is the time to be sure you water weakly, weekly. For cattleyas and other orchids with pseudobulbs, once new growths are mature, fertilizing is not as important, but right now, they are in the growth mode. Other genera, such as members of the vandaceous group, phalaenopsis, paphs, phrags and jewel orchids can be fertilized as long as it is warm. My preference is to use a balanced fertilizer with extra calcium and magnesium. Be careful not to use exotic fertilizers unless you know how it will affect the water pH. That is one of the reasons to recommend simple, slow release type fertilizers such as Nutricote.

Insects also respond to warmer conditions and need to be watched carefully. If scale or thrips are discovered treat quickly before they spread. If just a few are found on one plant remove the orchid and use a fine jet of water to remove the problem, being sure the underside of leaves and rhizomes are washed. If possible, isolate the plant for a month or so and watch it carefully. In my greenhouse, the orchid is sprayed thoroughly and the bench where it was found is also drenched in an appropriate pesticide and the entire area watched through the summer. Over time, most of my insect problems have disappeared, so it is rare for the entire collection to be treated.

This is also the time of year when snails and slugs seem to come from nowhere. Actually, they have been there all along, but the cool temperatures limited their activity. Now, instead of just grazing the algae near the bottom of a pot they emerge and munch on new roots and growths. There are many treatments that work well for these pests depending on your growing area and conditions. Some of these are toxic to pets so read labels carefully.

Note: Dr. Courtney Hackney wrote a monthly column of his orchid growing tips for about 20 years; we are reprinting some you might have missed, this one from May 2013.

Mounted Orchid Care

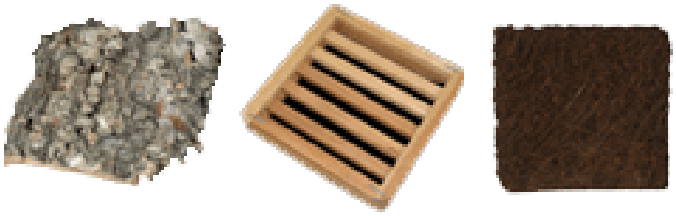
by RePotMe.com, 302.855.5859
Reprinted with Permission

There is something really special about mounted orchids. To see an orchid grow as it would in nature, as an epiphyte clinging to a tree, is a new, fun, and educational way to experience an orchid's growth. One fairly common orchid that really enjoys living on a mount is Brassavola nodosa, also known as the "Lady of the Night" for its delightful evening fragrance. This Brassavola nodosa orchid is growing happily on a tree in a garden in Kauai, Hawaii. In tropical conditions growing mounted orchids is easy, one might even argue it is easier than growing them in a pot. It is easy when there is ample water and humidity such as in a tropical garden, outdoors in warm climates or in a greenhouse. It is not as easy inside a home. It is difficult to keep a mounted orchid watered enough when it is grown inside a home, especially in dry air during the heating season. There is also the logistical challenges of bringing it somewhere like a sink to water it and where and how to hang the mount.

Brassavola is a wonderful addition to an orchid collection but it often becomes unruly in a pot. Its thin pseudobulbs are topped with rigid terete leaves that are often pointy and sharp at the end. These pseudobulbs have a habit of growing every which way at random rather than the more controlled growth patterns of other orchids. They will happily crawl out, over, and around the side of a pot. In addition, Brassavola nodosa can quickly grow ill in pot culture if the media becomes too sodden for too long. For us they seem especially intolerant of poor conditions in a pot yet grow happily on a mount, even tolerating dry conditions longer and better than our other mounted orchids will.

Orchid Roots and Mounts. In this close up photo we can see how the orchid roots love to grow along and cling to the tree bark. Other than terrestrial orchids, this is how orchids grow. Growing in a pot must seem strange to the plant in comparison. This particular tree, with its craggy bark, is a classic spot for a happy orchid. We can see how the roots follow the uneven surface, finding support and water among the crevices. Orchid roots grown in a pot are round but mounted they flatten to grasp the mount.

The classic mount for orchids is cork which is available in plaques of varying sizes. Some orchids, particularly those with thin roots such as Oncidium are fond of tree fern mounts and we see their roots growing all the way through them. A branch from a tree that has been trimmed can make a good mount; we really like to set an orchid in the crook of a branch when possible. Wood slat plaques look something like the flat bottom of a vanda basket and can be used either as a vertical or horizontal mount.



Mounts for Orchids. Mounting orchids seems strange but is really fairly easy to do. The first thing is to find a suitable mount. In our view the easiest mount to work with is the traditional cork mount. The next thing is to choose how to secure the plant to the mount. Virtually anything can be used to secure the orchid to the mount with the goal being that after a year or so the orchid will be attached to the mount and the support can be removed. To secure an orchid to its mount one can use string, fishing line, plastic plant ties, even cut up pieces of panty hose, glue or staples. It comes down to the personal preference of aesthetics and ease of use. We like the look of fishing line which is a bit hard to tie but the finished look is worth it. Once the plant has established itself on the mount the fishing line can be cut and carefully pulled away from under and around the roots.

Last, but not least, is to find an orchid to mount. Don't choose a favorite orchid to experiment on at first. Some genera take to mounting in cultivation easier than others; we would recommend starting with a Brassavola, Oncidium, or Dendrobium. Phals can be mounted, and we grow some species that way in our greenhouse, but it is challenging

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to provide the humidity they require especially in home culture. But, if their needs can be met, Phalaenopsis are very beautiful mounted.

A Tale of Two Orchids. We were growing two identical Brassavola orchids, both in pots. At repotting time we chose to divide one of them and put the two divisions on mounts and repot the other. The two mounted plants have done very well and within a few years were nearly the size of the undivided plant.

How to Mount an Orchid. The first step is to prepare the mount that you have selected. Usually some type of hook needs to be secured to the mount to allow it to hang. We like to put two screws or eyelets in the sides of a cork mount with wire between them in much the same fashion as a picture frame is hung with wire. The next step is to decide whether to use a pad of sphagnum moss with the mount. We like to use a small amount of moss both beneath the roots and on top of them when initially mounting a plant. This increases moisture and seems to reduce the shock of transferring from pot culture to mounted culture. Over time the moss falls off or can be pulled off once the orchid is adjusted and firmly attached to its mount. Next take the orchid (which has been removed from its pot and the roots cleaned of old media) and hold it against the mount. Try to place it so that the orchid will be able to grow in its natural direction up the mount. Once established, the orchid will not come off the mount. We have a mounted Oncidium that has grown up so far as to have left the top of its mount and we had to secure an additional mount above the old one for it to continue growing up. Ideally a large enough mount should be chosen to last the orchid for some years.

Practical Considerations. Mounted orchids need to hang somewhere. In a greenhouse they are typically hung from the rafters or from installed rods or mesh screening. In the home it is more of a challenge. One approach is to wedge the mount into a clay pot or vanda basket for support. Another approach is to take a wine or soda bottle and fill it with sand. Put a wire stake or phal hook down into the bottle with part sticking out the top. Stabilize the hook by replacing the cork in the bottle, wedging it in firmly. This provides a nice support for a mount.

Watering. Mounted orchids want to be watered frequently and daily watering is often required when they are grown inside our home. While they can go for a few days without water this puts stress on the plant. Water needs are highly dependent on the amount of light, heat, air movement and humidity and so it is difficult to give good guidelines except to say that mounted orchids require considerably more frequent watering than their potted counterparts do. The practical consideration here is that if the plant is indoors it must be taken regularly to the sink for watering. With a bottle support the entire mount and bottle can go into the kitchen sink to be watered. Mounts like to get nice and wet so let the water run for at least a few minutes

Citric Acid for High Alkalinity Water
by Sue Bottom, sbottom15@hotmail.com

When we first moved to St. Augustine we used well water for watering the orchids. Within about six months, we began to notice white deposits forming on leaves and the plant growth just did not look healthy. After analyzing the well water, the problem become obvious, the 350+ ppm alkalinity was simply too high for good growth.

We considered installing a rainwater collection system, but looking at the pond behind the house we thought why not use the water that is already collecting in this big natural cistern. The pond water is a blend of rainwater and spring water and depending on how much rain we get the alkalinities range from 40 to 130 ppm so it seemed like a perfect solution. It was filtered to remove solids and run through an UV filter in an attempt to kill pathogens, though it may not have functioned as intended given the tannic nature of the water.

We were always worried about what microbial organisms might be introduced to the greenhouse with the water. We had recurring battles with black rot and botrytis, and then there was the year with a lot of bacterial flower blighting. In retrospect, many of these problems were likely caused by contamination in the pond water. There is not much point in growing orchids if the flowers are ruined the minute they open. It was time for another mid-course correction. If we injected copper or quaternary ammonium compounds to kill disease organisms in the pond water, would be also kill the microflora around the roots? What about an ozonation or reverse osmosis system?

Rather than spend thousand of dollars on a pond water treatment system, we reconsidered the options. Perhaps there is something we could do to make the well water usable year-round. The option to inject strong mineral acids to reduce alkalinity was rejected due to the inherent risks, but how about that citric acid you read about being much safer to use, how expensive is it? Well, a 50 lb bag of food grade citric acid from BulkApothecary.com arrived shortly thereafter at a cost of about $70. That is enough to last for about 6 months, less than the fertilizer budget, maybe not so expensive after all. We have been using citric acid for 6 months now so we are still in the experimentation phase, but so far it looks very promising.

Positive and Negative Effects. After 6 months, the plant response is very impressive. There are multiple leads on new growths, new growths are taller and fatter than prior growths, and growth is robust. My unproven hypothesis is the citrate is enhancing the symbiotic relationship between the orchid roots and rhizosphere microflora improving nutrient uptake. For those with a highly organic potting mix, this increased microbial action might likewise result

in premature degradation of the substrate. There are some white markings on the leaves from the calcium and magnesium in the water, but it is not excessive. You are reducing the alkalinity (largely bicarbonates) via the acid reaction, but not the hardness (a measure of calcium and magnesium content). In the early days of testing, too low pH irrigation water caused some chemical burns on the edges of flowers but this does not seem to occur at a pH of 5.8.

Impact on Microflora. Apparently, there is a lot more going on with our orchid roots than we know about. The roots of many plants actually exude organic acids including citric acid to help modify the root zone pH and to provide a food source for the rhizosphere microorganisms who, in return, make nutrients more absorbable by the plants. Could the unreacted citrate in the fertilizer solution actually cause proliferation of the microflora in the rhizosphere enhancing nutrient uptake by the orchid roots? There is a lot of information available about the mycorrhiza (association between microorganisms and higher plants) of orchids in vitro, much less information is available for the mycorrhiza of mature photosynthesizing orchids, a fascinating subject for future exploration.

Your water quality is one of the most important determinants in how well your orchids grow. If you notice hard water stains on your orchid leaves, you can reasonably assume that your bicarbonate alkalinity is high and it is likely to increase the root zone pH over time making certain nutrients less available. Up to a certain point, you can use an acidic reaction fertilizer to help keep your root zone pH in the desirable slightly acidic range. If the fertilizer alone does not do the trick, think about adding some citric acid to your fertilizer program. You will have to spend a little time and some gray matter to quantify the addition rate. After that, it is a simple matter to spoon a little citric acid into your fertilizer solution. Do not be surprised if you see a slow and steady improvement in your plants from this simple adjustment.

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Determine Whether Citric Acid Will Work for You. If you have high alkalinity water and are comfortable with basic chemistry, here is what you can do to see if citric acid might be a solution for your water quality issues.

Step 1 - Quantify Your Alkalinity Level. The first step is documenting the alkalinity level in your water. Send a sample of your water to a commercial water quality laboratory (like QAL Labs or JR Peters) to set your baseline at a cost of around $40. The lab results will also let you know if you will need to supplement calcium and magnesium levels, whether sodium or some other element is present in dangerous amounts, etc.

Step 2 – Set Your Target End Point. Select a target bicarbonate alkalinity for your orchids, probably ideally in the 80 to 120 ppm range. Water in this range of bicarbonate alkalinity should have an approximate pH of between 5.8 and 6.2 (Argo and Fisher 2008). Do not try to lower alkalinity levels too much below 100 ppm. Leaving some residual buffering capacity in the acidified irrigation water will allow some breathing room for seasonal variations in alkalinity without running the risk of over acidification.

Table 1 – Theoretical Citric Acid Addition Rates Based on Alkalinity

Irrigation Water Alkalinity (ppm as CaCO3)	Amount of Citric Acid to Add to Reduce Water pH to 5.8 (tsp/gal)
150	0.09
175	0.11
200	0.13
225	0.14
250	0.16
275	0.17
300	0.19
325	0.20
350	0.22
375	0.24
400	0.25

Based on 0.26 gm/gal-meq/l alkalinity to reduce irrigation water pH to 5.8 (Bailey and Bilderback).

Step 3 – Calculate Your Hypothetical Addition Rate. There is little published information about using citric acid to acidify water, but one excellent source recommends the citric acid addition rates calculated for you in Table 1 to lower the pH of your irrigation water to 5.8 (roughly correlative to an alkalinity of 80 ppm).

Step 4 – Bench Scale Testing. Before you start watering your orchids with acidified water, do a bench scale test where you add small amounts of acid to a fixed volume of your water and measure the pH. For my bench scale testing with a 400 ppm alkalinity, I used a 3 gallon bucket and added citric acid to it in ¼ tsp increments, stirred and tested for pH using a good quality meter (like the Bluelab combo meter) until I reached the desired pH. This bench scale testing should give you the data you need to establish the acidification rate that works for your water and your growing conditions.

Step 5 – Adding the Acid to the Irrigation Water. If you have a system to inject fertilizer into your irrigation system, you will simply add the citric acid to the fertilizer mixing tank. Fill your mix tank three quarters full with water, add the proper amount of citric acid to meet your goal, then add any fertilizer you wish to use and complete filling the tank with water. Mix the solution thoroughly to make sure all solids are dissolved and you are ready to water.

If you do not have a plumbed system in which you inject fertilizers into your irrigation stream, you will have to work out the easiest way to add citric acid to your water. If you water with a hose, you might consider buying one of the siphon systems. This will make fertilizing easier and you would just add the citric acid to the suction line tank.

If you are growing indoors and have to move everything to the kitchen sink to water, you could water as is your normal practice, and then pour the citric acid/fertilizer solution through the pot. You would use the addition rates in Table 1. To reduce the alkalinity from 350 ppm to approximately 80 ppm and a pH of 5.8, you would add 0.22 tsp/gal or just under 1/4 tsp to a gallon jug of water. Add your fertilizer and then drench the pot one last time.

Step 6 Verify Your Assumptions. When you first start using citric acid, test the pH of the acidified water to make sure it is in the 5.8 to 6.2 range. Use a good, calibrated pH meter to verify your assumptions. If you notice the pH is drifting upward or downward from your expectations, adjust your citric acid rate accordingly. You may see normal seasonal variations in your water quality and these simple tests will prevent you from over or under acidifying your water.

Atlanta Botanical Garden
Orchid Adventures

The Atlanta Botanical Garden is a great place to visit. Surrounded on three sides by Piedmont Park, the Botanical Garden came into existence in the mid 70's and has since grown to about 30 acres of outdoor gardens and greenhouses. Outdoors there are natural areas, a suspended canopy walk, formal plantings of roses, annuals, hydrangeas and lots more together with garden art, fountains and plant sculptures. The Fuqua Conservatory has a desert house, a tropical orchid display house and a high elevation house featuring many cool growers we have only read about. You'll enjoy this botanical delight. With our AOS membership, admission was free!

Show Table

Grower Courtney Hackney
Paph. Ho Chi Minh

Grower Art & Jane Russell
Maxillaria tenuifolia

Grower Janis Croft
Tolumnia

Grower Suzanne Susko
Den. unicum

Grower Art & Jane Russell
C. Green Emerald 'Emerald Queen' AM/AOS

Grower Yvonne & Bob Schimmel
Ascda. Perla del Caribe

Grower Sue Bottom
Iwanagara Apple Blossom 'HR Yellow Star'

Show Table

Grower Suzanne Susko
Pot. Joy Sokabe 'Shining'

Grower Roberta Hicks
Enc. Orchid Jungle

Grower Joey Hopkins
Phalaenopis

Grower Sue Bottom
Phal. Cradle Song x Phal. aphrodite

Grower Courtney Hackney
Blc. Ports of Paradise 'Emerald Isle' FCC/AOS

Grower Joey Hopkins
Lc. Irene Finney 'Spring Bounty' AM/AOS