

CLUB NEWS



Steve Arthur

March 7 SAOS Meeting

by Janis Croft,
secy@staugorchidsociety.org

Welcome and Thanks. President Bob Schimmel opened the meeting at 7:10 pm with 49 attendees. Bob thanked Jeanette Smith, Shirley Browning, Roberta Hicks and Celia McElroy for the refreshments. He then reminded all to drop a dollar in the jar when they

enjoy their refreshments. We welcomed three guests along with 1 new member, Gail Turner.

Our Membership Veep Linda Stewart recognized our 5 March birthday people with free raffle tickets. Bob informed all that the Best of Show voting would occur between the Show Table discussion and program and encouraged all to vote for their favorite orchid.

Club Business. If you haven't done so, it's time to renew your membership, \$15 for individual and \$25 for family.

The next Ace Repotting Clinic will be on April 1 from 9 am — 1 pm.

The March 12 Keiki Club will be at the Bottom's home where Sue will discuss Repotting and Types of Potting Mixes. Bring \$5 to cover potting materials along with a clay pot or basket. If you have more than one plant to repot, bring them to Ace repotting session. Think about what you would you like to see or do at our Keiki clubs. Feel free to make suggestions or verbalize your thoughts to either Sue or Mary Colee.

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.

Save the Date, April 23 in the late afternoon, for our SAOS Picnic and Orchid Swap. Events Veep Dianne Batchelder will bring a sign up sheet to the next meeting for side dishes and desserts. BYOB. The club will provide the hamburgers and hot dogs. Also bring your extra divisions of plants to trade or sell.



Janis Croft explained that the Board decided to not put in a SAOS exhibit at the JAX show due to lack of participation and plant commitments. Harry McElroy offered to include anyone's plants in his personal exhibit, contact him for more information. Christie Peppard asked people who are attending the show to volunteer in the kitchen for 30-60 minutes to help Celia who stepped up to the job after the sudden illness of the kitchen coordinator.

Club librarian, Penny Halyburton brought in a DVD explaining the repotting process for many orchid varieties. Remember to email Penny (librarian@staugorchidsociety.org) with your book/DVD request and she will bring it to the next meeting.

Our AOS Representative Suzanne Susko noted that the latest AOS Orchids magazine has a big article on native California orchids. She suggested that you look up native orchids in Florida and watch for them along the sides of the roads we drive. She then encouraged all to subscribe to AOS using the trifold pamphlet at the Welcome Table (as a side benefit, SAOS gets an extra free month of the magazine for each subscription).

Shows in Florida this Month:

[Fairchild Orchid Festival](#), March 10-12

[Jacksonville Orchid Society Show](#), March 18-19

[Port St. Lucie OS Show](#), March 18-19

[Gulf Coast Orchid Alliance Show](#), March 24-26



Show Table Review. Courtney Hackney did not know where to begin with this month's Show Table. There were so many different genera so he decided to talk in generalities

Continued on page 3



CLUB NEWS



Upcoming Orchid Events

March

- 10-12 Fairchild Orchid Festival
Fairchild Botanic Garden
- 11-12 Boca Raton Orchid Society Show
Safe Schools Institute
- 12 Keiki Club Get-Together, 1 pm
Potting Mixes and Repotting Orchids
Sue and Terry Bottom's Home
6916 Cypress Lake Ct, St Aug 32086
- 14 JOS Meeting, JOS Show, 7 pm
Show Committee Update
- 18-19 Port St. Lucie Orchid Society Show
Port St. Lucie Community Center
- 24-26 Gulf Coast Orchid Alliance Show
Naples United Church of Christ

April

- 1 SAOS at Ace Hardware, 9 am til 1 pm
3050 US 1 S in St. Augustine
- 1-2 EPIC Celebration of Spring
Annual Flower and Garden Expo
Ag Center, St. Augustine
- 1-2 Orchid Society of Highlands County Show
Bert J. Harris Ag Center, Sebring
- 4 SAOS Meeting, 7 pm
Spring Orchid Auction
- 7-8 Englewood Area Orchid Society Show
Englewood Methodist Church
- 11 JOS Meeting, Topic TBA, 7 pm
Tom Wise, Johns Island Orchids
- 22-23 Vero Beach Orchid Society Show
Riverside Park
- 23 Picnic and Orchid Swap, 4 – 6 pm
In Lieu of Keiki Club
Memorial Lutheran Church
3375 US 1 South, St. Aug 32086
- 28-30 Deep South Orchid Society Show
Central Georgia Botanical, Savannah

May

- 2 SAOS Meeting, 7 pm
Glenn Gross, Gross Orchids
Mounting and Care of Orchids

- 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
- ?? JOS Picnic
3611 Richmond St., Jax 32205
- 19-21 Redlands International Orchid Festival
Fruit and Spice Park, Homestead

St. Augustine Orchid Society Organization

President	Bob Schimmel schimmelr55@bellsouth.net
Vice President Events	Dianne Batchelder ladydi9907@aol.com
Vice President Membership	Linda Stewart lindstew@hotmail.com
Vice President Programs	Sue Bottom sbottom15@hotmail.com
Secretary	Janis Croft croftie1984@gmail.com
Treasurer	Bill Gourley wgourley@bellsouth.net
Directors at Large	Mary Colee mcolee4@gmail.com Susan Smith 2manysmiths@comcast.net Suzanne Susko suzsusks@bellsouth.net
Exhibit Committee Chair	Janis Croft croftie1984@gmail.com
Librarian	Penny Halyburton phalyburton@comcast.net
Newsletter Editors Webmasters	Sue and Terry Bottom sbottom15@hotmail.com tbottom14@hotmail.com



CLUB NEWS

Continued from page 1

about each of the main ones represented. Since it is Phalaenopsis season, he started explaining that you can tell that Phalaenopsis equestris is in the background of those multifloral phals that had nice branching and were multi-floral. They tend to be early flowering as well as nicely shingled. Phal. amabilis is often found in the background of standard white phals. There was also a nicely shingled, yellow flowered phal. Courtney pointed out that hybridizers worked for years to get clear yellow flowers in Phalaenopsis that didn't fade.

He then moved on to the Cattleyas group, pointing out the shorter inflorescence of the Schombocat. There was a highly desirable Lc. Fire Dance with its beautiful orange blooms.

Next up were the Dendrobiums and he showed the Den. nobile first. He noted that if you see keikis forming on the cane, you should reevaluate your cultural conditions. This one looked well grown so he wasn't worried but some times that can mean damage to the roots or too much fertilizer during the resting season. The Den. aggregatum was an example of a plant that needs to dry out in the winter in order to bloom. He enjoyed seeing the Den. To Shay XOXO and said that as the Australian varieties become more popular, he hopes we will start having more plants from down under appear in the U.S.

The beautiful Paph. Saint Swithin is a huge multi-floral plant that is a Paph. rothschildianum hybrid. Courtney brought in his own Paph. Ma Bell that is fragrant and grows on limestone. He successfully grows all of his paphs/phrags in lava rock.

A blooming Bulb. blumei, grown on a slat with moss to keep it moist and let it sprawl, had unique tiny flowers. Check out the photos of our show table examples at the end of the newsletter and on the SAOS website.

SAOS Program. Steve Arthur of [Steve Arthur Orchids](#) in South Carolina talked to us about "Potting Orchids with Cypress Mulch." He purchases his cypress mulch from the big box stores and mixes a basic, starting mix using 3 parts cypress to 1 part #4 grade (extra large) sponge rock. He advises that you wet the sponge rock before dumping from its bag so as not to breathe in the damaging dust. Steve has found that the advantages of using this mix are first that the pH level is around 6.5. With his naturally pure water, he does not have to repot for 4 - 5 years and if repotting due to growth, he often keeps the same mulch in the new pot and just adds more. Some experimentation with our high dissolved solids, high alkalinity water will be necessary to see if we can achieve similar results.

Cypress mulch cannot dry out. He keeps it wetter in summer and slightly drier in winter and always uses pots

with extremely good drainage. You do not need to sift the mulch, use it straight from the bag. Pick out the very large pieces but keep in the small pieces as the roots like to grow and anchor around them. Pack the mulch very tightly similar to how we used to pack osmunda so tightly so the orchid roots would grow well. He fertilizes as he does for plants potted in pine bark; he top coats with Nutricote.

He showed videos of preparing different variations of the mix for different species of orchids. An example for Paphiopedilums, he added oyster shell (purchased from feed store) with some charcoal. For Phalaenopsis, he drenched sphagnum thoroughly and then wrung it out and cut it into small pieces to add to the mix. He experimented with a mix for terrestrial orchids that used 1/2 soilless mix to 1/2 cypress mulch. For some of the rupicolous laelias that grow on rock outcrops, he added some granite gravel and they grow quite well in this mix.

Next Steve moved on to share some of his greenhouse tips. He showed a video where he was blasting a plant with a strong stream of water to rid the plant of scale. Since scale embed their mouth parts in the plant, the stream of water separates the remainder of the insect from its mouth which ultimately kills it. He recommends doing this first and then applying your usual insecticide. Then he showed us an inexpensive method of potting up a plant using coconut liners from Walmart (without the plastic inner lining). Put the plant and a good amount of mix in center of liner then start bringing the edges of liner up to the top of the roots to form a ball while still stuffing with more and more mulch until it feels like a softball. Using filament line, start wrapping around the ball and then tie off the line to secure the closure. Next make a U-shape on one end of a 14 gauge wire and shove it up threw the center and add another U-shape at that end and you have a hanging plant. To close his presentation, he showed us slides of collecting trips he has taken to Belize and Ecuador. It was educational to see the variety of orchids growing in their native habitat.

Meeting Conclusion. Harry McElroy announced the Member's Choice Award as his Paph. Saint Swithin. The Raffle table closed out the evening. Thanks to those that volunteered to stay and clean up the room.

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



CLUB NEWS

January Keiki Club

Winterizable Shade Structure & Rain Barrels



More than a dozen folks met out at Janis and Alan's home on the River for the Keiki club. Janis gave us a tour of her shade structure that has retractable curtains and a small heater for the cold weather and opens up into a well ventilated shady structure during warmer weather. She talked about the decision making process in determining what and where to build and then talked about some of the details of her set up. She has a system for automatic watering when they are out of town, and electronic thermometers to give readings of the maximum and minimum temperatures. Janis' plants are all thriving in her shade structure, they seem to really enjoy their new home!

Linda Stewart gave a short talk on designing a rain barrel system. She pulled together the information into a notebook you can borrow listing the types of components you'll need to assemble your own rain barrel system. There are various types of diverters that can be chosen and you can even have several rain barrels in series if you need more water. Linda talked about some of the plumbing details for you to consider in order to maximize the effectiveness of your system. Very informative!

Changes to Keiki Club Schedule

This year we've been having double header topics to be able to provide lots of orchid growing tips during the spring Keiki Club get togethers. We're planning a summer hiatus when so many are vacationing during the summer heat. This year we're going to end the spring Keiki Club meetings at the April Picnic and Orchid Swap where Susan Smith will also talk about growing paphs and phrags. This talk was originally planned for a May Keiki Club that has been rescheduled to the April picnic due to scheduling conflicts.

Time to Pay Your 2017 Dues

It is that time again. Membership dues for 2017 are now due. Welcome back to all our renewing members! Dues are \$15 for an individual and \$25 for a family. You can mail your membership check to SAOS c/o Bill Gourley, 807 Kalli Creek Lane, St. Augustine, FL 32080. You can also pay online with PayPal, using the individual or family membership links on the website. We will be updating our 2017 SAOS roster and email distribution list soon. You do not want to miss any newsletters!

March 12 Keiki Club

Repotting and Mounting Orchids

The Keiki Club will be on Sunday, March 12 at the home of Sue and Terry Bottom, where we'll have our annual repotting meeting. Many of your orchids are sending out new roots, this is the best time to move them to a new home. We'll talk about repotting using different potting mixes as opposed to how to grow your orchids au naturale. There may be some orchid divisions for you to mount and or pot up (one to a customer), bring a 4 and 6 in clay pot or basket, just in case. To cover the cost of supplies, there will be a \$5 charge. If you have more than 1 or 2 of your own plants that need repotting, please bring them to the Ace repotting clinic.

Where: Sue and Terry Bottom's Home
6916 Cypress Lake Court, St. Augustine 32086
When: March 12, 1 to 3 pm

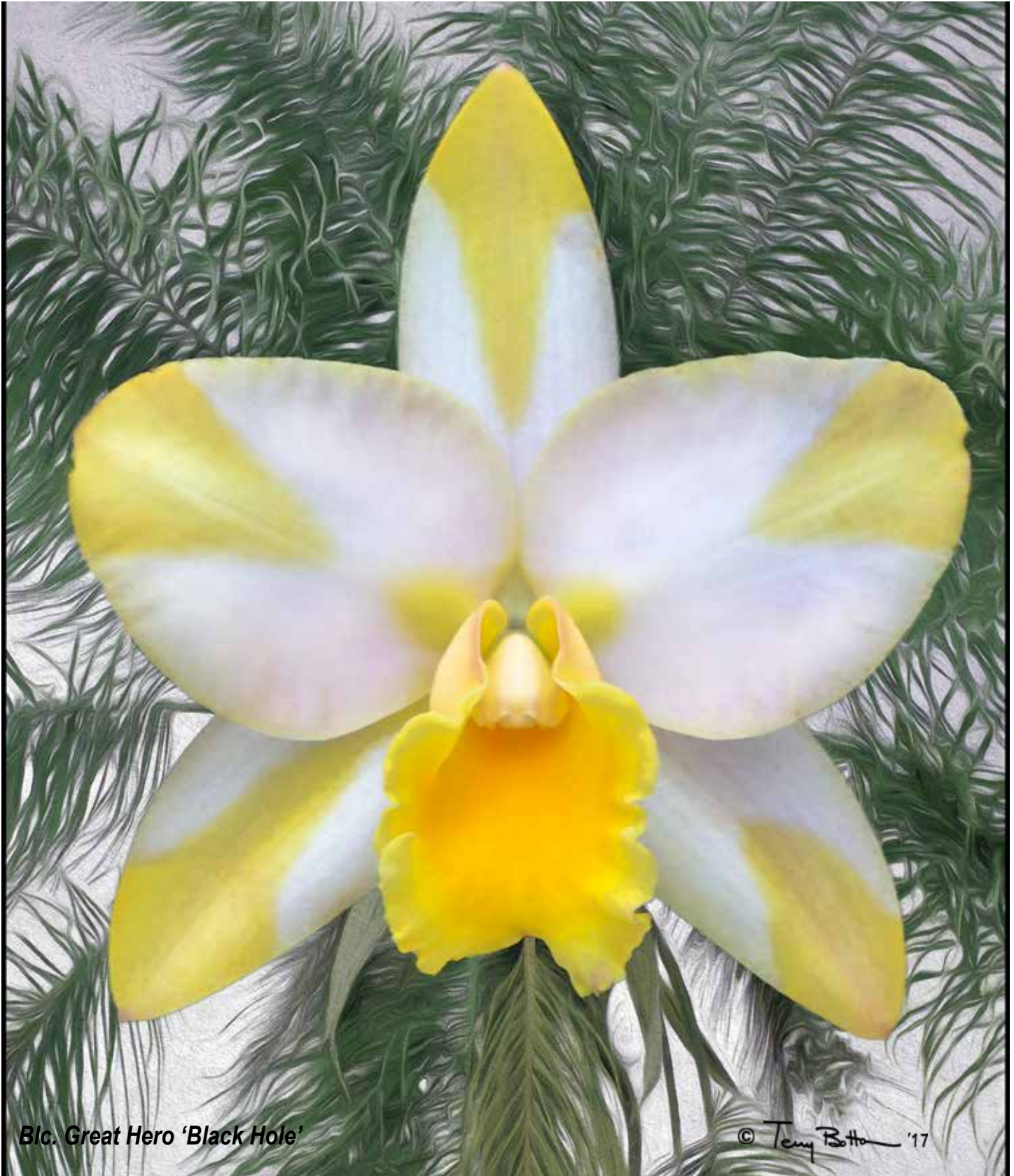


April 4 Monthly SAOS Meeting Spring Orchid Auction

We'll be having our spring auction at the meeting in April. An advance listing of the plants to be auctioned will be posted online to whet your appetite. We'll have great refreshments and a lively auction. Courtney will talk about the show table plants, so don't forget to bring your beautiful blooming plants to the meeting!



INSPIRATION



Blc. Great Hero 'Black Hole'

© Terry Botta '17



CULTIVATION



Orchid Questions & Answers

by Sue Bottom,
sbottom15@hotmail.com

Q1. I was hoping you could identify this orchid for me.

A1. That looks like a B. Little Stars, a primary hybrid between *B. nodosa* and *B. subufolia*. It

is incredibly well grown and flowered. Congratulations on your beauty.



Q2. I bought this *Paph. primulinum* in October. It just fell and before I repotted it I took these photos. The orchid looks great but there are NO green roots and there is no new root growth either. What are your thoughts? It is planted in Orchiaata and Styrofoam.

A2. The roots look darn good to me! Paphs are semiterrestrial so they



have hairy roots more like plants that grow in soil. They do have a greenish whitish hairy root tip when the roots are lengthening. If they feel plump and hairy, they're healthy. Courtney swears by adding a teaspoon or two of dolomite to the top of the pot a couple times a year, and he grows great paphs. They're also one of the few orchids that don't seem to suffer from repotting, in fact they kind of enjoy it!

Q3. My *Encyclia cordigera* suddenly, within a week, dropped two leaves and two pseudobulbs started to turn yellow from the apex to the base, with a brownish tone also. The affected pseudobulbs look shriveled. Right now there isn't any foul smell. What could be happening?



A3. It looks like some sort of rot, as you obviously suspect when you say it has no foul smell. Are the yellowing/browning bulbs hard or soft where it is discolored? If the bulbs are hard, you would think perhaps *Rhizoctonia* root rot although that typically happens when the mix turns sour and of course your plant is on a mount. Are there any live roots attached to the dying bulbs? Your roots look good, so I'm guessing *Rhizoctonia* isn't the problem. It's probably more worrisome that the next two bulbs have leaves yellowing, so you would suspect that the infection, whatever it is, is travelling up the rhizome and travelling fast. The speed with which it's moving makes you think it's one of the water molds rather than *Rhizoctonia*, which is typically very slow to progress.

If it is one of the water molds, also called black rot, your friend is your shears, you'll have to cut away all the infected tissue. You can pour hydrogen peroxide over what's left and if you have one of the good fungicides like Subdue that is labelled specifically for *Pythium* and *Phytophthora*, drench what is left of the plant with it. It's really a shame cause the new growth is so nice and healthy and should have been in bloom soon.



CULTIVATION



When to Start Fertilizing in Spring

Courtney's Orchid Growing Tips

The only real rule of orchid growing is that the rules are just guidelines. Winter was brief and many different orchids are both blooming earlier and initiating growth early relative to most years. Orchids that rely on day length instead

of temperature for blooming are following their normal blooming and growth pattern. Readers of this column know my normal advice is to limit fertilizer applications to warmer months, but this year is different because the environment where my orchids are growing has been different. My orchids that rely on temperature to start are in a different growth stage than those that rely on day length. How do I know that some have started their growth cycle and others not? Should fertilizing applications begin if some orchids are growing and others are not?

There are many hanging orchids in my greenhouse, not just because of space, but because they are some of the "canaries" that tell me how my orchids are interpreting light levels and temperatures. Especially important in my greenhouse are bifoliate cattleyas, such as *C leopoldii* and *C guttata*. When these species initiate their new growth, spring is officially here. No matter what the calendar says, they are getting close to initiating new growths.

Many of my spring blooming cattleyas and paphs are orchids that use temperature to tell them when to grow and flower. Unfortunately, this year these will be finished flowering when the spring orchid shows need exhibition plants. Many of these have almost always bloomed within a week or so of the same time each year, but this year will be an exception based on buds I see swelling in the sheaths.



When orchids initiate new growths, it is time to begin using fertilizer regularly and at higher doses. After several months of flushing during the fall and winter, nutrients adhering to media have largely been lost or used up. During the last several years, I have limited fertilizers in an attempt to avoid producing lush foliage that can be attacked by bacteria and fungi.

There are some orchids that do receive regular fertilizer, albeit at lower levels in winter. Those include orchids that are growing and blooming such as phals and paphs, which I keep in different places. Many cymbidium growers follow a similar fertilizer regimen, but use fertilizer higher in phosphorus, the middle number, starting in fall.

Hobbyists with just a few plants have an easier time making the decision because they can look at each plant and decide to fertilize or not. This is really easy if Nutricote, which lasts six months, is your fertilizer of choice. The balanced formulation is an excellent one for all orchids and safe to use. I usually add it to the surface of the medium in early March, but recommend adding it now if your orchids are starting to grow new leaves or breaking eyes for new pseudobulbs. If you cannot find Nutricote in your local store, check with Carter & Holmes Orchids. They sell small quantities. If your temperatures have not been as warm as here in north Florida, you might need to wait a little longer. Let your orchids tell you when you need to begin adding fertilizer.

It will be interesting to see if there will be extra bulbs or leaves this year with a longer growing season.

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 February 2013.



CULTIVATION

Choosing Potting Media

by Ray Barkalow, FirstRays.com
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An attempt to answer the common question: “What’s the best potting medium for my orchid?”

The correct answer to that is that there isn’t a single, best medium! Instead, when choosing potting media, one has to take a “holistic” approach and look at a variety of factors, including:

- The growing conditions the plant prefers.
- The plant’s water storage capabilities.
- How well does the plant take to repotting, that is, being disturbed.
- What kind of conditions are you easily able to provide.
- How fastidious are you about watering and feeding, or at least what are your capabilities.

All of those factors should be considered when choosing a medium, and should be reconsidered for each type of plant you grow.

First of all, think about the conditions the plant experiences in nature (if it’s a hybrid, think about the species in its breeding background, especially recent ones). Right off the top we may be baffled, as orchids in nature usually have no potting medium at all, but are epiphytes, living attached to the bark of host trees! Look a little closer though, at the environment those roots, dangling in air, experience.

Water Supply: Is the plant from a rainforest, constantly bathed in rain or fog? Is it instead exposed to seasonal monsoons followed by relatively dry periods, or does it get typical, random rains such as seen in many temperate climates?

Air Movement: Heavy and wet, cool and buoyant, or parching, arid winds?

Growing Location: Is the plant from a bog, where it constantly has “wet feet,” or is it in leaf litter on a forest floor, in a densely-leaved host tree, nestled in the detritus

of fallen leaves, or up at the top where the wind and sun dry it out rapidly?

Typical Temperatures: Is the plant from a hot, intermediate or cool environment? (The choice of medium can help you grow a plant that otherwise might not do well in your environment.)

Next, let’s look at the plant’s physical structure, and how it relates to the plant’s water storage ability.

Plant Structure: Those with pseudobulbs can generally store water for longer periods of time than those without. Take a close look at the leaves as well, before concluding your evaluation. Those plants having thin, strap-like leaves, such as oncidium and cymbidium, will lose their stored water faster than those with shorter, thick leaves, such as cattleyas. Plants that don’t have pseudobulbs have in some cases developed thick, fleshy leaves (phalaenopsis, for example) as their water storage scheme, but that’s obviously not as effective as pseudobulbs. Others that have neither pseudobulbs nor thick leaves, such as phragmipediums, are going to need a steady supply of moisture.

Root Structure is another important aspect in deciding on the medium. The factors to consider are the extent of root growth (long versus short, branched versus single), the thickness of the roots, particularly that of the velamen layer. A very extensive root system suggests that the plant has to work hard for its water and nutrition, so wants to gather as much as it can when it is available. By contrast, a short root system suggests easy and/or frequent availability of them. Velamen – that layer of white that covers healthy roots – is actually dead tissue that acts as a sponge to rapidly absorb water and nutrients, so they can be passed onto the plant. Thick velamen is generally found on plants that like to grab a lot of water, but prefer to have their roots dry rapidly. Vandaceous plants are good examples. Don’t take that to mean that roots with thin velamen like to stay moist – you need to couple that with the plant’s storage structure, mentioned above. Oncidiums, for example, tend to have thin velamen on thin roots, but their root systems are quite extensive, and they have pseudobulbs for storage, so they too, like to dry fairly rapidly. Phalaenopsis, with their minimal storage capabilities, tend to have thick roots to add to the “reservoir,” so do well in a damp, but not sappy environment.

As to **how well a plant tolerates repotting**, that can generally be judged by the plant’s growth rate, with slow-growers being less tolerant of disturbance than others. Some plants, notably paphiopedilums, seem to actually enjoy repotting, often putting on a growth spurt immediately afterwards!

Your growing conditions play a most significant role in deciding on a medium. If you have no problem providing a constantly humid environment due to your climate or if you

Continued on page 9



CULTIVATION

Continued from page 8

grow in a greenhouse, the moisture retention on the part of your media is less of a concern. Ambient temperatures play a role here, as well, as warmer temperatures tend to increase the evaporation of water, and along with the drying rate of the medium.

Your personal tendencies, and how much time you can - or prefer to spend watering your plants is another significant factor in choosing a medium. If you're a "busy bee" who likes to pamper your plants, then an open medium that doesn't hold a lot of water may be a good choice. If, on the other hand, you have a large collection and don't have time for such individual attention, or if you travel a lot on business, it might be worth thinking in terms of a more stable moisture holding selection.

OK, now that we have the background behind us, it's time to look at the various media ingredients that are commonly available, and their specific properties.

One of the more common media ingredients – used alone or in blends – is **bark**. The irregular shape of the pieces of bark can lead to excess packing, which may reduce the airflow to the root system, so consider going a little on the "coarse" side. Finer grades are often used for small seedlings, and the coarser grades for large plants. Orchinata bark is a superior brand, offering some significant advantages over others. Before using most bark products on the market, they need to be soaked overnight; for Orchinata, do not soak it, but water it lightly with boiling water to facilitate wetting, then let it cool.

Coconut husk chips (CHC), made from the pithy covering outside of the spherical, hard coconut shell, is gaining popularity as a replacement for fir bark. It is readily available, relatively cheap, and wets and rewets better than bark. It also tends to be more regular in shape – chunks or cubes as opposed to coarse flakes – so facilitates better air flow throughout the root mass. CHC holds a lot more water than bark, so keep that in mind when using it. It lasts longer than fir bark, but not as long as Orchinata bark. A word of warning: despite claims otherwise, most CHC has a fairly high salt content when you get it, so it pays to soak and rinse it several times prior to use.

Coconut husk fiber is the wiry result of stripping and shredding the interior of the coconut husk, rather than chipping it. It is springy and flexible, and is often matted to form liners to hanging baskets, but it can also be use straight as a medium for plants that really like to dry out fast. If fairly tightly compressed, water will stay in pockets in the mass for a longer time period.

Coir, sometimes called "Coco-Peat," is the result of grinding the husk into coarse powder. It is often used as a substitute for peat moss in blends, but can be used alone for seedlings that like to stay damp.

Peat moss and its commercially available blends, such as ProMix HP, are sometimes used in the so-called "mud mixes," which hold water really well. Like coir, it can be blended with other ingredients to produce a good medium for terrestrial and semi-terrestrial species.

Osmunda fiber, the roots of a number of ferns from the genus *Osmunda*, used to be a staple in the orchid-growing community, but it is now difficult to find a high quality fiber. It is tough and springy, and requires vertical alignment in the pot to ensure proper drainage. In almost totally ensures that the plants' roots get all of the air they need, and as it decomposes, is an excellent source of nutrients, requiring little or no supplementation via fertilizers.

Tree fern fiber – the "trunks" of tropical tree ferns – has replaced most osmunda in orchid culture. It is very stiff and airy, and can be obtained as shredded fibers, chunks or slabs. It has little moisture holding capacity, so aerates media blends very well. The slabs are often used for mounting plants directly. Our own EcoWeb™ product is a recycled, synthetic analog of tree fern.

Redwood fiber, or "Palco Wool" as it is sometimes known, is a light, fluffy wood fiber that does not decompose, and is added as a moisture-retention aid and as a means of increasing the acidity of media blends.

Sphagnum moss is pretty much a standard in the orchid growing community, whether by itself or as a blend additive. Available in a wide range of quality – from the expensive New Zealand "Primo" and its close-but-less-expensive counterparts from Chile, to some really lousy stuff (short strands, no "fluff"), – the good stuff is a great medium for plants that love constant moisture. Learning how to attain the proper packing density is a challenge, as it holds so much water that it can become sopping wet pretty easily. Generally, sphagnum becomes sour and in need of replacement in the 6- to 9-month range, although that can be extended by blending it with charcoal.



Continued on page 10



CULTIVATION

Continued from page 9

Hardwood charcoal is a very long-lasting medium ingredient having a moderate-to-low moisture holding capacity. Many growers of vandaceous plants use the coarse grade as the sole medium. Some claim that the charcoal “sweetens” the medium by absorbing some of the foul chemicals produced in the decomposition of other media components, or excess salts from fertilizers.

Perlite, often referred to as “sponge rock” for the coarser grades, is expanded volcanic glass, and is a great aerator of blends, but still holds enough moisture to be a fairly good substrate for Semi-Hydroponic culture.

Pumice is similar in nature to perlite, but with a higher density and lower moisture-holding capacity.

LECA, standing for “Lightweight Expanded Clay Aggregate,” is a general term for any number of more-or-less spherical terra cotta pellets that were originally designed to be the aggregate in lightweight concrete formulations, but later diverted to horticultural use. There are many brands available, including Aliflor, Hydroton, PrimeAgra and others, and they vary greatly in their properties and applicability to orchid culture.

Diatomite is calcined diatomaceous earth muds. It is highly porous, and holds a tremendous amount of water. While it seems to be just too wet for Semi-Hydroponic culture, it has seen good application by itself for pot culture for plants that appreciate a damp root environment.

A few examples of the selections I make follow. Keep in mind that I am growing in a greenhouse in southeastern Pennsylvania, so the applicability of these may differ from yours.

Many of my small species plants are grown mounted on EcoWeb slabs or on virgin cork oak bark from Portugal. In the greenhouse, I’m able to keep the moisture level high to sustain their health.

Vandaceous plants are, for the most part, grown in baskets of coarse charcoal, although I have been successful with PrimeAgra in pots – or no medium at all – as well.

Cattleya-types are either in PrimeAgra in clear plastic pots, or in a blend I refer to as “Better Off”, a blend of Orchiaata Bark, perlite and charcoal, with all particle sizes approximately in the medium grade, at equal proportions.

For the majority of my moisture-loving plants, I use Semi-Hydroponic culture, using PrimeAgra medium, as it provides a constant moisture and nutrient supply, while guaranteeing great air flow to the root systems.

I use sphagnum for small, moisture loving seedlings, but usually move them into S/H culture as they mature.

As you gain experience with your plants, you’ll develop a “feeling” for their needs that will allow you to customize the medium for the plant. I have been known to use different media for different plants of the same species, just because they respond differently.

Calcium Deficiency in Cattleyas

by Sue Bottom, sbottom15@hotmail.com



Calcium deficiency in cattleya

You already know that calcium is an essential nutrient required for optimal growth of your orchids. Calcium is absorbed through the roots and moved upward through the xylem via the transpiration process. It increases cell wall thickness and strength among other things as well as a plant’s resistance to fungal and bacterial disease. The plant requires calcium the most during periods of active growth, while it is building new tissue. It must be supplied to the plant ratably in proportion to its growth rate. Calcium is mostly immobile in the phloem so the plant cannot translocate it from the older growths to the newer growth, like it can some of the other essential elements. An easy way to supply calcium to your plants is through water soluble calcium bearing fertilizers or calcium nitrate applications and many growers use media supplements like dolomitic lime (which supplies magnesium as well as calcium), gypsum (calcium sulfate) and calcium carbonate supplements (egg shells, oyster shells, etc.).

The most obvious sign of the deficiency is rapidly expanding tissue that becomes necrotic, such as a newly forming leaf or pseudobulb. Do not mistake this damage for the black rot caused by water molds just because it is black and the tissue looks like it is rotting. Black rot is a fast moving disease that often starts at the base of pseudobulbs and moves upward through the plant, killing within days. The necrotic tissue from calcium deficiency slowly continues to blacken. It is unsightly but not fatal to the plant. If you have been supplying enough calcium to your orchids in your fertilizer program but are still seeing the signs of calcium deficiency, there is some other cultural issue for you to diagnose and correct.

The plants in my greenhouse receive lots of calcium in their diet, from what is naturally present in the water as well as Cal Mag fertilizer and calcium nitrate applications.

Continued on page 11



CULTIVATION

Continued from page 10

Despite the high calcium diet, there were still black leaf tips on cattleyas during the growing season a characteristic sign of calcium deficiency. I suggested to Roy Tokunaga, who was visiting on a speaking tour, that it was impossible for my plants to have a calcium deficiency. Roy, if he had been wearing his deerstalker hat, might have said "...once you eliminate the impossible, whatever remains, no matter how improbable, must be the truth". Instead, Roy sort of smiled and then proceeded to explain how a damaged root system, an accumulation of salts in the root zone or inadequate hydration can all impede calcium uptake.

Root Damage. Despite your best efforts to supply sufficient calcium, your plants can still suffer from deficiency if something interferes with the uptake of this critical element. Calcium is mostly absorbed through the roots so a compromised root system can easily manifest itself in signs of calcium deficiency. Root function can be disrupted for many reasons. One of the most common causes of root damage is the repotting process itself, particularly when orchids are repotted when new roots are not actively forming. The older roots are damaged in the repotting process and the plant must send out new roots to stabilize. Chewing pests like snails and roaches can eat the tender new root tip. Once damaged, the roots need to regrow before the plant will stabilize and be able to absorb water and nutrients. A waterlogged potting mix can suffocate roots. Water logging doesn't occur as a result of overwatering per se, it occurs when there is insufficient air around the roots because the potting mix is too fine or the organic matter has degraded and compacted around the roots.

Salt Build Up Around Roots. As long as the concentration of salts in the potting media is less than that inside the root, water is pushed into the root by osmotic pressure, termed root pressure. Salts naturally present in your water supply or added by fertilizers can build up in the potting mix from the repeated wetting and drying cycles and unless flushed from the pot, can interfere with root function. If the salts in the potting media build up to unsafe levels, water will tend to move out of the root rather than into the root. The root damage might be obvious, roots look stunted and may have brown markings. A sure sign of excess salts is when the root looks fine until it touches the clay pot or top of the media and then blackens.

Inadequate Hydration. Calcium uptake is directly related to the transpiration rate, the process by which most of the water absorbed by the roots is pulled upward through the vascular tissue and ultimately evaporated from the stomata (openings) in the leaves. Plants that are not transpiring

at a high rate do not take up large amounts of calcium. One of the orchid's adaptations to an epiphytic lifestyle is a thick cuticle with few stomata to prevent water loss. Those orchids that adapted to a xeric environment keep their stomata closed during the day, only opening at night when temperatures are a little cooler and humidity is higher, in an effort to prevent water loss. When humidity is very low, the stomata may remain closed day and night in which case transpiration does not occur so no calcium is absorbed. If grown under too dry conditions, there may not be enough moisture taken up by the roots or that can be robbed from adjacent cells to the xylem for there to be a continuous flow of water from the roots to the leaves for transpiration. A strong transpirational pull is essential for calcium uptake.



Calcium deficiency shows itself by blackend leaf tips.



Excess Phosphorus Levels. Different cations can compete for uptake. High phosphorus levels have been found to increase die back symptoms in cattleyas (Poole and Sheehan) because excess phosphorus is antagonistic to calcium absorption by the root system. The phosphorus levels of 100 ppm used in their experiments to induce leaf-tip die-back is probably more representative of bloom booster fertilizers having a high middle number in the fertilizer formula. As long as you are not using bloom boosters too frequently or acidifying your water with phosphoric acid, excess phosphorus levels are probably not a concern for the orchid hobbyist. To a lesser extent, potassium and some other nutrients can be antagonistic to calcium uptake but this would not be expected to occur with most fertilizer formulations.

Unusually High Temperatures. In their article *Leaf-tip Die-back of Cattleya – What's the Real Cause*, Poole and Sheehan postulate that unusually high temperatures in the absence of the cooling effects of frequent watering can interfere with calcium uptake:



CULTIVATION

Continued from page 11

Several factors must therefore be present in order for die-back symptoms to occur. First, the plant must be in active vegetative growth, especially the stage of rapid leaf expansion which would require high light intensities, good fertilization and warm temperatures. Second, temperatures surrounding the root system must be higher than normal. The epiphytic medium can be expected to reach temperatures comparable to the high air temperatures of a greenhouse during the summer months unless some control of root temperatures is used, such as more frequent watering. However, any cultural factor that would injure the roots and affect their capacity to absorb calcium during periods of active vegetative growth could in itself induce calcium deficiency without high root temperatures. Third, the degree of susceptibility is dependent upon the genetics of the plant. We have noted symptoms on *Cattleya* hybrids, *Epidendrum anceps*, *Stanhopea* species and possibly *Vanda* from which we did not take tissue samples.

Lessons Learned. Roy is not the kind of guy that walks into your growing area and tells you what you're doing wrong. He does not like to make a diagnosis just based on his visual impression after a walk through, but his powers of observation are keen and after much discussion, he offered his opinion as to why some of the cattleyas were suffering from calcium deficiency despite their high calcium diet. The verdict: inadequate flushing of salts from the pot, compounded by inadequate hydration. Some of the roots on the plants with calcium deficiency symptoms looked stunted and perhaps inadequate hydration during an extraordinarily hot July could have exacerbated the problem. The contrast between the plants grown under cover in the greenhouse and those grown in the new shade structure without a roof was significant. Both receive the same fertilizers but the summer rains flush excess salts from the shade structure plants while salt levels build up in the greenhouse pots. Plants growing in the shade house are also cooler in the heat of the day than those in the greenhouse because of the more buoyant air movement as well as the more frequent watering schedule (because they are potted in an ultra-coarse, freely draining mix to be able to withstand a week of rainy weather during the tropical storm season).

Roy's suggested solution was pretty simple, adjust the watering practices in the greenhouse. Roy recounted advice from his mentor, Wilbur Chang, who recommended an initial watering followed by a second more thorough watering an hour or so later, to mimic the water uptake that might occur in a gentle rain. The velamen surrounding the roots has an opportunity to change from the hydrophobic



Damaged roots on this bifoliolate are just starting to regrow, you can see the branching rootlets emerging from the older roots.

state in which the velamen functions to limit water loss to the hydrophilic state in which it swells and absorbs moisture like a sponge. Dycus and Knudson documented how orchid roots absorb moisture the fastest during the first 90 minutes after immersion in water, and then continuously though at a decreasing rate for the next 7 days. Perhaps even though I water frequently, not enough moisture is retained in the coarse mix after a single watering pass. The double watering step not only helps hydrate your plants, it also helps leach salts every time you water, similar to the practice recommended by Bergman in his excellent article about leaching salts from the medium. The more dissolved solids are present in your water, the more critical it is to leach salts away from the roots to prevent salt toxicity. Roy had another suggestion, consider top-dressing the pots with a peat-based product like Pro-Mix, sphagnum moss or cypress mulch, anything that will retain moisture in the top of the pots that the plants can use to keep the roots and themselves a little cooler during the hot summer months. Note to self: top dress cattleyas after repotting next year to help protect those tender new roots and help them get a healthy start on life. Of course, we will have to wait for the next growing season to confirm that the combination of healthy, hydrated and cooler roots plus plenty of calcium prevents the young cattleya leaf tips from turning black.

Orchid growers spend a lot of time worrying how best to supply the proper nutrition to their plants. Not only do you have to give them enough calcium, you need a healthy root system that can absorb the calcium. There must be sufficient moisture available for the calcium to move upward in the plant with the transpiration stream. It is all about the roots, a healthy root system is the key to your orchid growing success.



SHOW TABLE



**Grower Penny Halyburton &
Michael Rourke
Den. Love Memory**



**Grower Linda Stewart
Iwanagara Apple Blossom**



**Grower Linda Stewart
Onc. Cebolleta**



**Grower Bob & Yvonne Schimmel
Epi. ciliare**



**Grower Shirley Browning
Phal. White NOID**



**Grower Suzanne Susko
C. Snow Blind 'Kenny'**



**Grower Suzanne Susko
Den. To Shay XOXO**



SHOW TABLE



Grower Sue Bottom
Cl. Grace Dunn 'Chadds Ford' AM/AOS



Grower Harry & Celia McElroy
Paph. Saint Swithin



Grower Suzanne Susko
Blc. Sarah Palin 'Hockey Mom' AM/AOS



Grower Penny Halyburton & Michael Rourke
Phrag. sargentianum



Grower Janis Croft
Den. aggregatum



Grower Lourdes Guell
Blc. Mahina Yahiro 'Mishima' AM/AOS

