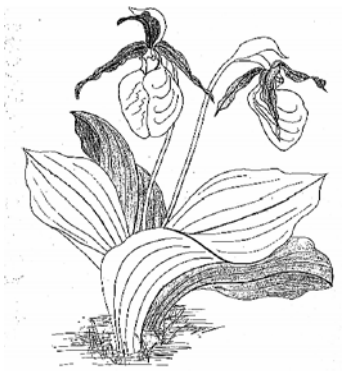

The Atlanta Orchid Society Bulletin

Affiliated with the American Orchid Society, the Orchid Digest Corporation and the Mid-America Orchid Congress
2001 Recipient of the American Orchid Society's Distinguished Affiliated Societies Service Award
Newsletter Editor: Danny Lentz **Society Librarian: Elaine Jacobson**

Volume 46: Number 1 www.atlantaorchidsociety.org January 2005

JANUARY EVENTS

The Meeting:

8:00 Monday, January 10 at Atlanta Botanical Garden
Mike Coronado, RF Orchids

The Atlanta Orchid Society is fortunate to have Mike Coronado with RF Orchids in South Florida as our January speaker. Mike's topic will be "Growing Vandaceous Orchids." He'll cover the basics for success with these orchids (Vandas, Ascocendas, and other hybrids and species in the Vanda alliance). Please see the article about RF Orchids on page 11 in this newsletter. You can visit their website at http://www.rforchids.com .

DUES ARE DUE (YES IT'S THAT TIME AGAIN!!!!!!)

Dues ($30 single, $45 household) for the calendar year 2005 are due. Your membership dues continue to bring you a monthly newsletter and underwrite the cost of speakers and programs presented throughout the year. Prompt payment helps us determine our budget for the year. Dues can be paid directly to our Treasurer, Reba Herzfeld, at the monthly meeting or paid by check (payable to the Atlanta Orchid Society) mailed to: Reba Herzfeld, 4798 Summerset Lane, Dunwoody, GA 30338.

Inside This Issue

COLLECTOR'S ITEM

Artorima erubescens Dressler & Pollard

Are-tore-EE-mah air-oo-BES-enz

Tribe: Epidendreae

Subtribe: Laeliinae

Etymology: Latin *artus*, narrow; *rima*, cleft

This very rare species was separated by Dressler and Pollard from *Epidendrum* based on a number of structural features and its unique pollination mechanism. In this species, pollination depends on pollinia adhering to the pollinating bee's foot. Access to the stigmatic cavity is through a narrow T-shaped slit. The visiting bee, holding the column apex, gets a foot caught in the slit between the column wings, and, extricating itself, picks up a caudicle with its pollinium attached to its foot. Repeating the procedure on another flower, the pollinium may be inserted when the bee's foot is again caught. The Milkweed family is the only other plant family with a demonstrated foot pollination mechanism.

The plants have thick, rigid rhizomes with plump, short pseudobulbs spaced as much as 30cm apart. The pseudobulbs may be purple or brown in color and carry three to six leaves. The plants usually grow in high-elevation cloud forests with evergreen pines and rough-barked oak trees in the Sierra Madre del Sur and the Sierra San Felipe in the states of Oaxaca and Guerrero, Mexico. The panicles, reaching as long as a meter or more may have as few as 6 flowers or as many as 100, each over an inch in size. Flowering occurs from December to February. In its native habitat, flowers are collected for Christmas holiday sales in local markets.

These plants absolutely require cool conditions and resent daytime temperatures above about 75F. Night temperatures as low as 45F are common and they are good companion plants for masdevallias and odontoglossums. The species requires very bright light ranging from 2500-3500 footcandles (Cattleya light conditions to nearly Vanda light levels). While very desirable cool greenhouse subjects, this is a difficult species to keep going for more than a few years. They are hard to establish initially, requiring a division about 3 feet or more in length and will not flower until they have produced two or three well rooted strong growths. Because of their rambling growth habit, they are best grown mounted on a slab of cork or tree fern.

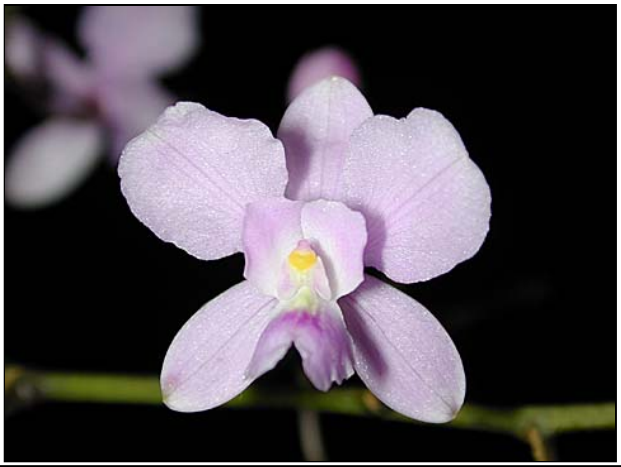

Photo courtesy of Andy's Orchids

Events Out and About

January
Saturday, 1/8. American Orchid Society monthly judging, Atlanta Center, 2 pm, ABG basement workshop. If entering plants, please arrive before 1:30 pm to allow time for research and paperwork.

Monday, 1/10. Atlanta Orchid Society monthly meeting, ABG, Day Hall, 8 p.m. Michael Coronado from RF Orchids will talk about Vandaceous orchid culture and hybridizing. Mike will bring plants to sell.

Saturday, 1/29. Orchid show in Gautier, MS. Sponsored by the Gulf Coast Orchid Society, contact: Glen Ladnier (228) 832-0999.

February
Saturday, 2/12. American Orchid Society monthly judging, Atlanta Center, 2 pm, ABG basement workshop.

Monday, 2/14. Atlanta Orchid Society monthly meeting, ABG, Day Hall, 8 p.m. Mark Reinke will talk about culture and breeding in Broughtonia.

Saturday, 2/19. International Phalaenopsis Alliance (IPA) meeting at Peach State Orchids, Woodstock, Georgia. 10:00-3:00, greenhouses open at 9:00. There will be two speakers and a plant raffle.

Monday, 2/28. Plants entered for Southeastern Flower Show, 4-8 P.M. at the Georgia World Congress Center. On-line plant entry accepted through February 14. Free 1-day pass with plant entry. Contact Danny Lentz or Dianne Morgan for more information. SEFS website: http://www.flowershow.org/.
See page 7 for details.

March
Wednesday to Sunday, 3/2 to 3/6. Southeastern Flower Show, Georgia World Congress Center.

Please visit our web site at http://www.atlantaorchidsociety.org

The Atlanta Orchid Society web site contains recent newsletters and articles as well as a calendar of events and information about our annual shows.

MINUTES OF THE DECEMBER MEETING

The meeting was called to order by President Evan Dessasau. The minutes were approved as written.

Installation of new officers was postponed until January.

David Mellard thanked everyone who participated in putting on our show in November.

We enjoyed a nice spread on the buffet table. Thanks to everyone who brought something to eat.

Jim Rose of Cal-Orchid gave a presentation of breeding lines for short reed-stem Epidendrums, including his own lines and those of other breeders in Japan and California.

Mikie Emerson and Karen Chandler gave a short presentation about donating school supplies to the elementary school being run by Ecuagenera.

The gift exchange was held.

Respectfully submitted,
Danny Lentz

Newsletter Submissions
To submit material for the newsletter, or to sign up for the email version of the newsletter, please contact Danny Lentz:

DBLGONGORA@BELLSOUTH.NET

MAIL TO: Danny Lentz
1045 Wordsworth Dr.
Roswell, GA 30075

The deadline for submissions is the 20th.

Advertising
Advertising is now being accepted for our newsletter. The size and number of ads may be limited at the discretion of the editor. Advertising Rates per issue are: ¼ page $10, ½ page $20, full page $40.

Join the Atlanta Orchid Society
Membership in the Atlanta Orchid Society is $30 for individuals or $45 for couples. Yearly membership runs January 1-December 31. If you join after September your membership will include the following year. You can join at one of our monthly meetings, or contact the society's Treasurer for a membership application. The Treasurer's contact information is on page 2.

For directions to the Atlanta Botanical Garden, please visit their web site at www.atlantabotanicalgarden.org or contact one of our society's officers listed on page 2.


C. percivaliana 'Jewel'

DECEMBER 2004 EXHIBITION TABLE AWARDS

with notes by Ron McHatton

CLASS 1: CATTLEYA ALLIANCE

Blue	*C. percivaliana* 'Jewel'	Collier/Reinke
Blue	*Bc.* Makai 'Louise' AM/AOS	Collier/Reinke
Red	*C. percivaliana*	Brinton/Park
Red	*L.* Canariensis 'Golden Glow' HCC/AOS	Collier/Reinke
White	*Lc.* Novissima 'Blue Shadows'	Collier/Reinke

(Blue) ***Cattleya percivaliana* 'Jewel' :** This species is commonly called the Christmas Cattleya in reference to its sharply defined flowering season. The species originates from rocky highlands in Venezuela and is generally lithophytic (rock-growing) rather than epiphytic. To grow and flower well, the species needs abundant light and less water than other unifoliate Cattleyas. The species occurs in a number of color forms ranging from albas to darker rose colored flowers. In spite of its Christmas flowering season, the species has been little used by hybridizers. This is due, in part, to its smaller sized flowers and their rather peculiar musty odor.


Bc. Makai 'Louise'

(Blue) ***Bc.* Maikai 'Louise', AM/AOS :** This cross, *Brassavola nodosa x Cattleya bowringiana*, is an excellent pot plant and if you have room for only one Cattleya it's one to think about. This hybrid is very easily grown and, unlike some *B. nodosa* hybrids, is amazingly easy to flower. The plants break multiple leads and rapidly develop into specimen plants. It might be noted, that the *Cattleya* parent is now considered by some taxonomists to be *Guarianthe bowringiana*, having been separated from *Cattleya* along with the other Central American species such as *C. skinneri*. This separation is based on many factors, but the most easily recognized one is the elongated fusiform (funnel-shaped) pseudobulb, often more than bifoliate, with its swollen knuckle-like base.


Cym. Pipeta

CLASS 2: CYMBIDIUM

Blue	*Cymbidium* Pipeta	Decaminada

(Blue) ***Cymbidium* Pipeta :** This miniature *Cymbidium* cross, *floribundum* (*pumillum*) x Spartan Queen, was registered in 1961 by Dos Pueblos Orchids in Goleta California. The cross is not at all common in current collections. It represents a good example of the use of a miniature species crossed to a cool-growing standard. Flower count is generally very high, a trait inherited from *floribundum* while its brown flower color tends to be recessive. Breeding with this species as a direct parent reached its peak during the mid-1960's but its influence continues to be felt in more complex hybridizing during the late 1980's to mid-1990's.

CLASS 3: DENDROBIUM : No Entries

CLASS 4: EPIDENDRUM

Blue	*Prosthechea cochleata*	Collier/Reinke
Red	*Barkeria* Jim Balch	Collier/Reinke
White	*Bard.* Bamboo Dance 'Cherry Moon'	Hartong


Prosthechea cochleata

(Blue) ***Prosthechea cochleata* :** The most generally accepted name for this species today is *Prosthechea cochleata*. The species was originally described by Lindley in 1763 as *Epidendrum cochleatum*, changed to *Anacheilum cochleatum* by Hoffmans in 1842 and again changed by Dressler in 1961 to *Encyclia cochleata*. Recently, Carl Withner has proposed yet another name, *Panarica cochleata*, based on the length of the lip, but this name is not generally accepted and apparently there is no molecular evidence to support the change. The species (regardless of the name you chose to use) is widespread from Southern Florida, throughout the Caribbean, Mexico and south to Northern South America. There are two distinct varietal forms, the variety *cochleata*, found throughout the range with the exception of South Florida and the variety *triandra*, found only in South Florida. The latter is readily distinguished by the presence of an additional anther. The species is vigorous, easily grown in warm, bright conditions and the successively-flowered inflorescence provides a very long flowering season.

Odcdm. Wildcat 'Perfume Lily'

CLASS 5: ONCIDIUM ALLIANCE

Blue	*Odcdm.* Wildcat 'Perfume Lily'	Caine
Red	*Odcdm.* Wildcat 'Blood Ruby' AM/AOS	Lentz/Morgan
White	*Tolumnia* Ramona Wilson	Lentz/Morgan

(Blue) ***Odontocidium* Wildcat 'Perfume Lily' :** Speaking of more name changes……most of you will recognize this as *Colmanara* Wildcat. The name change arises from a change in the name of one of the grandparents of the cross. The genus *Colmanara* is composed of *Odontoglossum, Oncidium* and *Miltonia*. Unfortunately, the *"Miltonia"* species used in the background of this cross is actually *Oncidium fuscatum*. This is not a unique problem. This same species is the *"Miltonia"* in the background of *Miltonidium* Pupukea Sunset, *Miltonidium* Hawaiian Sunset, and *Miltonidium* Issaku Nagata to name a few. These are all technically straight *Oncidium*.

Paph. Leeanum

CLASS 6: CYPRIPEDIUM ALLIANCE

Blue	*Paph.* Leeanum	Whitfield
Red	*Paph. fairrieanum*	Lentz/Morgan
White	*Phrag.* Eric Young 'Puffin' HCC/AOS	Brinton/Park

(Blue) ***Paphiopedilum* Leeanum :** This is a cross of *P. insigne* and *P. spicerianum*, two species that are remarkably vigorous and easily flowered. The cross was registered in 1884 by Sir Trevor Lawrence representing one of the first Paph hybrids. The clear dorsal stripe and funnel-shaped dorsal base are both strong traits inherited from *P. spicerianum*. Both species in the background of this hybrid originate from moderate altitudes in what used to be known as Assam. In their native habitat, conditions are typically moist throughout the year. As a testament to this hybrid's vigor, I understand the foliage of this plant was very seriously damaged in a greenhouse fire not more than 4 or 5 years ago!

Phal. Orchidom Wild Spots

CLASS 7: PHALAENOPSIS ALLIANCE

Blue	*Phalaenopsis* Orchidom Wild Spots	Brinton/Park
Red	*Dtps.* (*Phal.* Mary Brooks x *Dtps.* Achy Breaky Heart)	Lentz/Morgan
White	*Phal.* Brother Lancer 'TK'	Walkosky

(Blue) ***Phalaenopsis* Orchidom Wild Spots :** The world of spotted Phalaenopsis can generally be broken into three broad groups; Harlequins characterized by brightly contrasting blotches of color on a white or yellow background, American Spots characterized by well-defined spots more or less arranged in coarse patterns, and French Spots characterized by fine to exquisitely fine spotting patterns arranged in lines or uniformly dispersed over the entire flower. *Phalaenopsis* Orchidom Wild Spots sort of bridges the latter two groups. The cross is a very complex one, going back at least 14 generations in some parts of its family tree. Spots vary from very finely divided lace-like patterns to more coarsely distributed patterns of violet spots on a white background. *Phalaenopsis stuartiana* appears remotely in the background of this cross and is the source of the concentrated spotting pattern (sometimes a distinct blushing is present also) on the lower halves of the lateral sepals.

Ascocentropsis pusilla

CLASS 8: VANDACEOUS ALLIANCE

Blue	*Ascocentropsis pusilla* 'Mello Spirit' CHM/AOS	Mellard
Red	*Ascda.* Crownfox Butterball 'Sunshine'	Walkosky

(Blue) ***Ascocentropsis pusilla* :** This species, originating from Vietnam and possibly other parts of southern China, was originally described by Dr. Leonid Averyanov in 1988 as *Ascocentrum pusillum*. Structural features of the plant as well as the elongated saccate spur are inconsistent with inclusion in *Ascocentrum* and Dr. Averyanov transferred the species to *Ascolabium* in 1994. Now the rules come into play. The type species for the genus *Ascolabium* was *Ascolabium pumillum*, a species clearly belonging to the earlier genus *Ascocentrum*. This creates the default situation that *Ascolabium* is a synonym of *Ascocentrum* requiring another transfer. Senghas corrected this situation with the new combination *Ascocentropsis pusilla* in 2000. *Ascocentrum* means hose-spur and *Ascocentropsis* means "similar to *Ascocentrum*."

Dendrochilum arachnites

CLASS 9: MISCELLANEOUS OTHER GENERA

Blue	*Dendrochilum arachnites*	Mayse
Red	*Maxillaria cucullata*	Mellard/Marino
White	*Cycnoches (herrenhusanum x chlorochilon)*	Hansen

(Blue) ***Dendrochilum arachnites*** **:** The genus *Dendrochilum* exhibits an exceptional degree of endemism with many species being confined to narrow elevational bands or individual mountain peaks or islands. *Dendrochilum arachnites* is endemic to the Philippines although found on several islands including Luzon, Mindoro, Leyte and Mindanao. The species is found as an epiphyte in rather bright moist locations from about 600 meters (2000 feet) up to about 2300 meters (8000 feet). This broad range in elevation makes the species rather adaptable and plants respond well under intermediate conditions. Unlike many of the *Dendrochilum* species whose pseudobulbs are tightly clustered, this species can have as much as 5cm rhizomes between pseudobulbs giving the plant a distinctive rambling habit.

2004 Ribbon Judging Results

Thanks to everyone for sharing your plants on the show tables. Last year 39 different persons/couples received at least one ribbon during the year. Gary Collier and Mark Reinke were the only ones to get a ribbon every month.

Winners: Quarterly winners each receive $25. The winner for the year receives $50.
1st Quarter : Richard Hallberg
2nd Quarter: Margo Brinton & Eldon Park
3rd Quarter: Gary Collier & Mark Reinke
4th Quarter: Danny Lentz & Dianne Morgan
2004: Gary Collier and Mark Reinke

2004 Top 5:
1. Gary Collier & Mark Reinke, 138 points
2. Danny Lentz & Dianne Morgan, 119
3. Margo Brinton & Eldon Park, 109
4. Richard Hallberg, 92
5. Rob Rinn, 84

AtOS Ribbon Judging 2004 4th Quarter Results

Name	Oct	Nov	Dec	Qtr 4
Lentz / Morgan	15	23	10	48
Collier / Reinke	9	9	22	40
Brinton / Park	17		9	26
Whitfield	12		5	17
Hansen		8	1	9
Mellard / Marino			8	8
Brannon	5			5
Caine			5	5
Decaminada			5	5
Mayse			5	5
Starling	5			5
Thurner		5		5
Dampog		4		4
Walkosky			4	4
Dufano		3		3
Emerson	3			3
Gilmore	3			3
Harrow	3			3
Phillips	3			3
Wolf	3			3
Hartong			1	1

Summary of Show Expenses for the Atlanta and South Metro 2004 Fall Show and Sale

The society made a profit of $2,000 from the Fall Show at the botanical garden due largely to members sponsoring trophies and providing the judges' luncheon instead of using a caterer. The income from vendors and sponsored trophies was $4,530, while show expenses were $2,507.17. The table to the right shows a breakdown of expenses.

Trophies	$931
AOS charges	$295
Food	$593
Office supplies	$141
AtOS Exhibit	$116
Rental tables	$358
Misc.	$70

We can really be proud that our society puts on one of the best orchid shows in the southeast. This is due in large part because so many people from the Atlanta and South Metro societies help out at the show from setting up on Thursday to breaking down on Sunday. I wish to personally thank all of you that worked the show, and a special thanks goes to Reba Herzfeld and Terri Hansen for all their hard work in hospitality and the judges' luncheon. A job well done by all.

David Mellard, Show Chair.

2005 Southeastern Flower Show
March 2-6

As many of you know, the Southeastern Flower Show (SEFS) has a special exhibit for orchids with most of the entries coming from the Atlanta Orchid Society and the South Metro Orchid Society. **People who enter orchids in the Horticulture Division get a non-transferable single-day free admission to the show.** You can pre-enter your orchids up to February 14 or you can enter them at the show on Monday, February 28. Please read the information below if you plan to enter plants. You also will hear more about this at the January and February society meetings. The web site for the show is www.flowershow.org.

If you pre-enter your plants it will help speed things up on Feb. 28 when you bring your plants to the show. Pre-entry runs through Feb. 14. You don't need to know the exact plants you will be bringing. If you pre-enter online, you should be able to edit your entries the weekend before the show and put in the real names. You can pre-enter plants online or mail in the form found in the SEFS Exhibitor's Guide.

To get a printed copy of the Exhibitor's Guide, please contact Danny Lentz or Dianne Morgan (dblgongora@bellsouth.net, 770-640-0112). To get a copy online, go to the SEFS web site and select "Competitions" from the column on the left. This will take you to a page where you can get information on all of the different areas of competition. In the column on the left, you can choose to view the entire Exhibitor's Guide or just the Horticulture section.

The Southeastern Flower Show is looking for volunteers to enter plants on February 28. Entering plants involves sitting at a computer and typing in the information from an entry card for someone who is entering plants in the show. If you wish to volunteer, please contact Darlene Palmer (trango@bellsouth.net).

Online Pre-Entry:
Go to the flower show web site at www.flowershow.org. Click on "Enter Exhibit" from the menu at the top.

If you entered online last year, you should have received an email with the user name for your account on the flower show web site. Some of the user names got changed by the system, so please make sure you can log on before the pre-entry deadline. If you can't, there will be a link on the web page for you to contact the flower show staff and get your current user name.

If you didn't enter online last year, create a new account.

If you need to update your user name, password, address, or email address you can choose the "Add, change or View your Contact Profile" option.

To enter an exhibit, choose the link for "Horticulture 2005" under the "Submit a New Entry" heading on the left side of the page. This will bring up a form to put in your plant information. **The entire name for your orchid should be entered in the "Genus" field.** Leave the other fields ("Species", "Variety", "Common Name") blank. You can just enter "TBD" for now if you don't know which plants you will be entering. Create as many entries as you think you might need. It doesn't hurt to create an extra entry.

Schedule of Events:

Monday, February 14, 2004: Deadline for pre-entry of plants to be exhibited in the 2004 Southeastern Flower Show. Please pre-enter your plants even if most of your entries need to be designated as To-Be-Determined (TBD). To pre-enter, you can mail in the Horticulture Division Entry Form in the Exhibitor's Guide (p. 49) or use the website: www.flowershow.org

Monday, February 28: Plant entry and display set up for the Southeastern Flower Show. Plant registration is from 4:00 PM to 8:00 PM, at the Georgia World Congress Center, Hall A. Registration requires that two 4" x 6" cards be filled out for each plant entered. It is best to fill these out at home rather than at the show. See the Southeastern Flower Show Exhibitor's Guide (p. 21) for specific information to be included on these cards and for an example of a completed card. The entry process will be described at both the January and February meetings of the AtOS. Contact: Danny Lentz or Dianne Morgan at (770) 640-0112, if you have questions.

Tuesday, March 1: AOS and ribbon judging of orchids entered in the Southeastern Flower Show.

Wednesday, March 2: Southeastern Flower Show opens to the public. Hours are 10-9 W-F, 9-9 Sat, 9-6 Sun. If you enter orchids in the Horticulture Division, you will receive a one-time free admission to the show. General admission to the show is $18 for adults and $6 for children 5 to 15.

Sunday, March 6: Southeastern Flower Show closes at 6 PM. Plant removal takes place from 6:30 PM to 7:30 PM. You must pick up your own plants or have made arrangements for someone to pick them up.

Growing Orchids in Atlanta
Part 3, Measuring Fertilizer Levels and pH

David Mellard

Introduction

In Parts 1 and 2 of this series, you learned how to choose the right fertilizer and how to dilute it to the nitrogen concentration you want to fertilize your orchids. Now consider using an electrical conductivity (EC) meter and a hydrogen ion (pH) meter as tools to help you grow better orchids. These instruments do several things. They verify that 1) the fertilizer concentration in the irrigation water and the orchid mix, 2) the pH of the fertilizer solution and the orchid mix, 4) the salt concentration in the orchid mix), and 5) how these factors change over time. The goal is to use these instruments to tell you when growing conditions are optimal and when growing conditions become unfavorable.

Commercial orchid growers often have better growing conditions than hobbyists because commercial growers are usually using a large portion of a greenhouse to grow a particular species. This approach allows the commercial grower to tailor their growing conditions for a specific group of groups to get maximum growth. Most hobbyists growers, however, usually end up with a mixed collection of orchids, often in different size pots, different media, and varying light and humidity throughout the year. The non-standardize conditions for most hobbyists increase mortality in their collection because the hobbyists does not know when conditions become unfavorable.

You've heard speakers state that they repot once a year or once every two years. It is very important to realize that they have learned to repot at certain time intervals based on their growing conditions (species grown, media, watering schedule, humidity, fertilizing schedule, etc.). Your growing conditions are likely to be different so your repotting times are likely to be different. In most cases, we've judged when to repot based on a guessed at time interval or from looking at the growing media. The pH and the EC meter can now be used to help to fine-tune your decision to repot. Just as important, the pH and EC meter can be used to ensure your orchids are being fertilized correctly and to grow your orchids in a mix that is beneficial.

Using the EC meter

First, let's look at how to use the EC meter to measure fertilizer concentration. The EC meter measures the salt level in the water, that is, the EC meter is measuring ions, such as calcium, magnesium, sodium, nitrate, and ammonium to name a few). Water has a background level of salt in it and fortunately in Atlanta, water contains very low levels of salt, just barely above what is found in rainwater. The EC measurement of Atlanta water is usually less than 0.1 mS/cm.[1] When a fertilizer is added to water at a certain concentration, it will have an EC measurement that is a combination of the EC measurement from the fertilizer and the background EC measurement. It is important to know that the specific EC measurement in a fertilizer-water mixture will vary depending on the brand name of the fertilizer. For instance, the EC measurement for the MSU RO fertilizer (13-3-15-8 Ca-2 Mg) diluted to 105 ppm nitrogen will have an EC measurement of 0.8 plus the background EC reading of water alone. Therefore, if ½ teaspoon of MSU RO water is added to 1 gallon of Atlanta water, the nitrogen concentration will be 105 ppm and the EC reading will be 0.8 to 0.9 mS/cm. If 1 teaspoon of MSU RO water is added to 1 gallon of Atlanta water, the nitrogen concentration will be 210 ppm and the EC reading will be 1.6 to 1.7 mS/cm.

The EC meter can be used to double check that you are mixing the fertilizer correctly. If you are using a mechanical system that automatically dilutes the MSU RO fertilizer into flowing water, the EC meter can verify that the fertilizer is being diluted to the desired nitrogen concentration. It can also verify that the same nitrogen concentration is coming out the hose at the beginning and at the end of the time spent watering orchids. I found this to be very important information since the automatic mixing system I was using started out with an EC reading of 1.3 mS/cm (150 ppm) but 20 minutes later the EC reading had dropped to 0.5 mS/cm (50 ppm). This drop in the EC reading meant I had to work with the system to ensure that the same nitrogen concentration was used throughout the watering time or in this case to buy a better mechanical mixing system.

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[1] Most EC meters have readouts in either mS/cm (milliSiemens per centimeter) or µS/cm (microSiemens per centimeter). 1 mS/cm = 1,000 µS/cm

If you are using another brand of fertilizer, I encourage you to read Bill Argo's Part 5 series, which is now the society's website (www.artlantaorchidsociety.org) and pay close attention to Tables 1 and 2 and the accompanying text. These tables show and the text describes how to dilute different brand fertilizers to ensure that you end up with the desired nitrogen concentration.

Now let's look at two other uses of the EC meter. The EC meter also can be used to decide if the orchid mix contains sufficient nitrogen and if salts are building up in the orchid mix. From Bill Argo's articles, a test called the pour-through method seems easiest to use to determine if the orchid mix contains sufficient nitrogen to maximize plant growth.

Here's how to do the pour-through test:

1) Fertilize your orchids using the nitrogen concentration you normally use,
2) After 30 minutes, pour enough distilled water through the orchid mix so that you collect 2 ounces of water that drain out of the container.
3) Measure the EC in the resulting 2 ounces of water.

If you are fertilizing at 125 ppm nitrogen, an EC measurement between 1.0 and 2.5 mS/cm is desirable. This reading means that orchids are receiving sufficient nitrogen but not to the point that salts are building up to dangerous levels. Remember, the EC reading of 1.0 to 2.5 mS/cm is a guide and is specific to the pour-through method. Salt sensitive orchids, such as Disa, will probably do better being fertilized at lower nitrogen levels and having an EC reading closer to 1. Some orchids that are heavy feeders (for instance, Cymbidiums) might tolerate higher fertilizer levels and higher salt levels, so an EC reading closer to 2.5 mS/cm might provide better growth. If the EC measurement exceeds 2.5 mS/cm, you should consider flushing the pot(s) with lots of water (with no fertilizer). You can check the EC reading after flushing a time or two and if the reading remains above 2.5 mS/cm, a logical step would be to repot the orchid. Testing other pots in your collection will give you an idea if it's time to repot all or most of your collection. If the EC reading is less than 1, then your orchids may need a higher nitrogen fertilizing rate, at least temporarily.

So, now you can see three very important functions of an EC meter. It can (1) verify that you have diluted the fertilizer to the right concentration, (2) guide you when to flush your pots or repot, and (3) guide you when to increase the fertilizer concentration.

Using the pH meter

The pH meter is also useful in making decisions about caring for your orchids. The MSU RO fertilizer mixed in Atlanta water will give a pH around 6.5. It is more important, though, to know the pH of the orchid mix. This can be determine by using the same pour-through method as described previously. Using the same 2 ounces of water that drained from the mix, measure the pH.

The optimal pH for orchids is not known. Bill Argo shows three pH ranges that generally apply to most plants (see Part 4, Table 1). For orchids, Bill recommends that the orchid mix should probably have a pH around 6 (and suggests a range of between pH 5.8 to 6.2). Remember, though, that for now, this optimal range is still an educated guess based on plants in general. Some exceptions for orchids come to mind. Cypripedium acaule grow in soil with pH levels around 3 to 4 while some limestone loving Paphs might prefer a pH that approaches neutral (that is, a pH just below 7). I was jolted into action a short while back when I measured the pH of a compot of Paphs and it came out to pH 4.5. One thing that happens at low pH levels is that the absorption of ions, such as iron and manganese, are increased. These ions have been shown to be toxic in some plants. Conversely, at high pH (levels approaching 7 and above), the absoprtion of phosphorus is reduced, which can lead to nutrient deficiencies so monitoring the pH of the orchid mix is important. What complicates the pH issue is that different orchid species might (and probably do) have different pH preferences. Obviously, more research is needed in this area as it pertains to orchids.

In summary, the advantage of using a pH meter to measure the pH of the orchid mix comes from identifying when pH levels are obviously in the danger zone. Therefore, if the mix is showing pH levels of 3, 4, or 8, you know that repotting probably should take place. You also should evaluate your brand of fertilizer to see if it is altering pH in the wrong direction. Remember, Atlanta has low alkalinity water and so requires a basic (nitrate based) fertilizer. You should avoid long-term use of acidic fertilizers because they will drive the pH down over time, thus increasing absorption of toxic ions, such as iron and manganese.

Some comments about EC and TDS measurements

You might have noticed in other articles written about fertilizing orchids that authors recommend fertilizing at 100 ppm or 200 ppm or some other ppm value. If the recommended ppm level was measured using a TDS meter (and most were) and if the article did not report the EC to TDS constant programmed into instrument, I doubt if you could follow the author's advice. The authors might even have been wrong in how they calculated the fertilizer concentration.

TDS measurements, which are given in ppm (parts per million) are actually an EC measurement (in mS/cm) multiplied by a constant that is programed into the instrument, which gives the results in ppm level. The problem arises because different TDS instruments use different constants to convert EC measurements in mS/cm to TDS measurements in ppm. These constants can vary from 400 to 1,000 depending on the manufacturer. Therefore, it's safer to use EC measurements in mS/cm (or uS/cm) rather than ppm.

Let's take the MSU RO fertilizer and ½ teaspoon in a gallon of water as an example. From the formula given in Part 2 of my series (and Part 5 of Bill Argo's series), ½ teaspoon of MSU RO fertilizer can be calculated to give a nitrogen concentration of 105 ppm. All EC instruments (regardless of the brand name and assuming that they are calibrated correctly) will give an EC reading of 0.9 mS/cm (0.8 from the fertilizer + 0.1 from Atlanta's background). Subtracting the background gives an EC reading of 0.8 mS/cm for just the fertilizer. You now know (because you've calculated it) that ½ teaspoon of MSU RO fertilizer gives 105 ppm nitrogen, and you now know because you measured it that the EC reading will be 0.8 mS/cm plus background.[2] If you measure this fertilizer water mixture with several TDS instrument, you are likely to get different ppm levels. If the TDS instrument is programmed with 400 as the EC to TDS constant, the TDS reading will be 320 ppm (0.8 x 400). If the TDS instrument is programmed with 1,000 as the TDS constant, the TDS reading on the same fertilizer solution will be 800 ppm.

While it is possible to give fertilizer concentrations in TDS measurements, the author has to know the EC reading and the TDS constant programmed into the instrument. As you can see, it's safer to go with just the EC measurement, which will be the same from EC instrument to EC instrument.
If all of this is still confusing, just remember to use the EC measurement in mS/cm to determine the fertilizer concentration rather than the TDS measurement in ppm.

Some thoughts about watering

Another important aspect of fertilizing orchids is the volume of fertilizer/water that is given to each pot. The standard advice from commercial growers in the horticulture industry is to water the pot with a volume of water that equals the size of the pot plus 20%. One problem with using less water is that less fertilizer is being applied. Let's use a fertilizer water mixture at 125 ppm as an example. If only half the volume of the pot is used to water a pot, the actual concentration of nitrogen being applied is about 60 ppm. The orchids are being underfed. A low EC reading (below 1 mS/cm) using the pour-through method is one indicator that insufficient water is being applied to each pot.

Some sources of EC and pH meters

EC and pH meters can be bought separately or in combination. I bought a combination EC/pH/TDS meter (specifically HI 9813 and HI98129) for $140 to $170 from Berry Hill Irrigation along with about $30 of calibration and storage solutions (http://www.berryhilldrip.com/HannaMain.htm). The instruments are very easy to use. An internet search for EC and pH meters will likely reveal other sources.

Practical advice for creating optimal growing conditions

Now, let's condense all this into a few steps that you can use in taking care of your orchids:

1) Use an EC meter to measure the concentration of fertilizer in the fertilizer/water mixture to ensure that the fertilizer water contains the correct amount of nitrogen.

2) Avoid using a TDS meter to measure ppm levels.

[2] If you use another fertilizer and add ½ teaspoon to a gallon of water, you most likely will get a different EC reading. However, no matter what EC instrument is used, they will all give you the same reading. In essence, you calibrated your EC reading to specific conditions (that is, ½ teaspoon fertilizer X + 1 gallon of a certain water).

3) If you are using the MSU RO fertilizer and mixing at ½ teaspoon per gallon of water, the nitrogen concentration will be about 105 ppm and the EC reading should be between 0.8 and 0.9 mS/cm. If you are mixing 1 teaspoon of MSU RO fertilizer to 1 gallon of water, the nitrogen concentration will be about 210 ppm and the EC reading should be between 1.6 and 1.7 mS/cm.

4) You can use different fertilizing concentrations if you like, just review Bill Argo's articles or read Parts 2 and 3 that I have written to determine how much fertilizer to add to a gallon of water to obtain a desired ppm level.

5) If you are using another brand fertilizer, you will need to read Bill Argo's Part 5 article (now on the society's website) to determine the appropriate EC reading.

6) You can use a pH meter and the pour-through method to determine if the pH of your orchid mix is optimal. The pH should be somewhere around pH 6. If the pH is 3 or 4, or above 7, the pH is probably not optimal for most orchids and you should consider repotting.

7) EC and pH meters are relatively inexpensive (considering the cost of orchids) and will allow you to make better decisions about how to grow your orchids.

R.F. Orchids, Inc.
Homestead, Florida

R.F. Orchids in Homestead, Florida, opened its doors in the fall of 1970 on a portion of Robert Fuchs' grandparents' property. At that time, Bob was teaching at Homestead Junior High, and the nursery was open only on weekends and afternoons after school. Mike Coronado literally grew up at R.F. Orchids, having been with the firm since 1976 when he was 13 years old. He started out working in the greenhouses, repotting, staking, fertilizing, packing, and shipping orchids. Later he became involved with exhibiting orchids and other facets of the business.

At the 11th World Orchid Conference in 1984, R.F. Orchids' *Vanda* Deva 'Robert' was honored as the Grand Champion, which catapulted the nursery to international recognition. A year later, Bob retired from teaching and incorporated the nursery. Mike became Vice President of the firm and is now in charge of growing and hybridizing. R.F. Orchids has continued to grow ever since

Mike has traveled extensively around the world to keep abreast of the newest trends in Vandaceous hybridizing. He has spent several months at R.F. Orchids' growing facility in Thailand learning techniques for the propagation and production of orchids for the international market. In his career with R.F. Orchids, Mike has also participated in many domestic and international orchid shows, including the Chelsea Flower Show in England and several World Orchid Conferences. One of Mike's favorite activities is the design of private orchid gardens. He was also instrumental in developing R.F. Orchids' "Orchid Camp", a series of educational classes about orchid growing in South Florida.

R.F. Orchids has won more AOS awards – nearly 700 since 1985 – than any other nursery or individual grower, and has received prestigious awards from the Royal Horticultural Society in England, subsequent World Orchid Conferences, and many other international organizations. The nursery has been featured in many publications, including *TIME*, *National Geographic*, the New York *Times, Casa y Estilo*, *Vanidades*, and *Southern Living.*

Maxillaria sophronitis

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For membership application forms contact Fred Missbach (404-237-1694)