

# The Bulletin

EPIPHYLLUM SOCIETY OF AMERICA



SPRING 2017 • VOL 72 • NO. 3



PHOTOGRAPH: Evelyn Shiraki

## “PINK TINSEL”

(‘Sonoma Sunshine’ x ‘Hurst Nursery’) x ‘Pink Parrot’

Hybridizer Evelyn Shiraki Reg. #14695

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**MEETINGS:** Begin at 7:30 p.m., on the first Tuesday of each month (except January, December and US national holidays). Admission and parking are free. Refreshments are served. Members and guests attending their first meeting receive a free potted epi. Regular meetings are held in Lecture Hall B, Arboretum of Los Angeles County, 301 North Baldwin Avenue, Arcadia, CA, USA. Take the Foothill Freeway (I-210) to the Baldwin Ave. exit, south. Follow the signs to the Arboretum. The December meeting is the Holiday Banquet. Paid dinner reservations are required.

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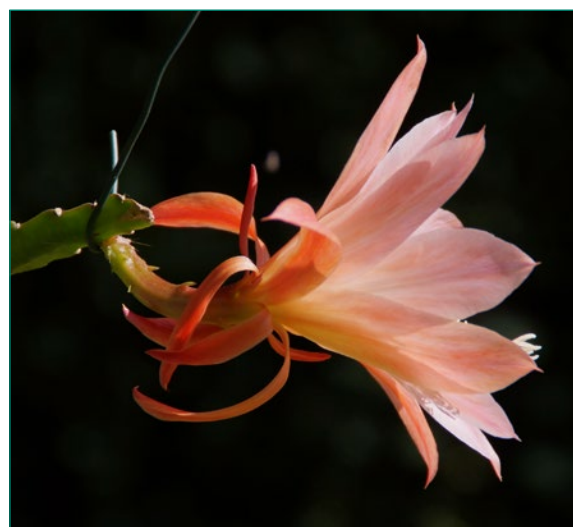
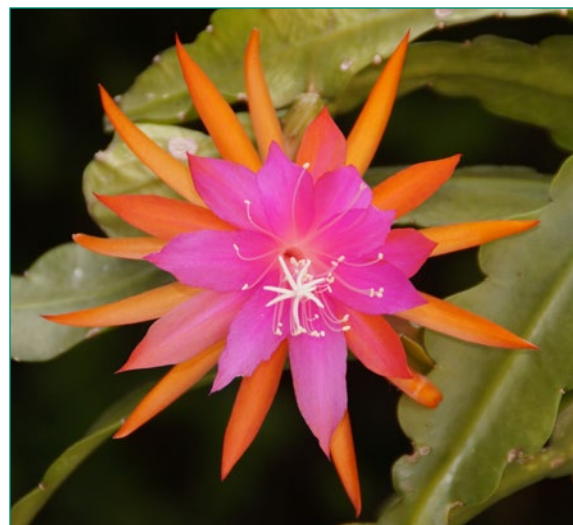
EXECUTIVE BOARD MEETINGS are open to all. The Board currently meets monthly, on the last Tuesday of the month at 7:00 P.M. Meetings are held either in the Bamboo Room, Arboretum of Los Angeles County, 301 North Baldwin Avenue, Arcadia, CA; or via a teleconference call. Please contact one of the Board Members before attending.





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From Top:  
*'Jalisco Charme'* - Rudolf Heßing-Herick  
*'Atreus Paetz'* - Helmut Paetzold  
*'Pronghorn'* - Darryl Miyamoto

# Culture Calendar for Spring

by Keith Ballard

Spring is when buds start forming, and the excitement builds as blooming season nears! It is time to feed your plants and watch for weeds, scale, aphids, snails and slugs.

Be vigilant! Weeds sprout and grow unbelievably fast. Get sprouts out by the roots before they get established. To get the oxalis roots you probably will have to go under the mix surface. The task is much easier just after a rain or thorough watering. Some growers use long "nosed" tweezers or pliers to pull below the soil line. If weeds are well established, repot with fresh mix after the blooming season. If you don't mind forfeiting flowers this year, repot now. Epies bloom best with crowded roots. A repotted plant is likely to develop roots, not buds and flowers. A pot with mature oxalis should be isolated before it develops seeds. This clover-like weed produces nearly invisible seeds which are expelled explosively into nearby pots when the days warm up.

Check for the spread of pests such as scale, aphids, mealy bugs, spider mites, snails and slugs. Most can be controlled with environmentally safe remedies such as a mild soap & water solution or rubbing alcohol. In its immature stage, scale can be eradicated with Malathion. Once scale mature into hard shelled discs, you'll have a couple of choices, one environmentally safe and the other highly toxic. The safe approach uses Medina Orange Oil (Available online from [www.medinaag.com](http://www.medinaag.com)). This should be sprayed on the branches at 1 tablespoon per gallon of water. In addition this solution should kill the other bugs as well. Orange oil spray kills scale, at 1 tablespoon per gallon of water, but the now empty shells do not fall off. If you want them off you'll have to wipe them off. The toxic solution uses chemicals like Cygon applied as a soil saturation solution to be taken up systemically by the roots, and also topically. Used at the recommended strength, Cygon on a cotton ball wipes established scale clean off. This is risky business, however, because Cygon is highly toxic. You need to wear protective clothing, glasses, hat, nose mask, glasses, and rubber gloves, AND work in a well ventilated spot so fumes will dissipate readily.

A 1:3 solution of household ammonia and water destroys slugs and snails (which you have to actually hit), and decomposes to form ammonia nitrate, a plant fertilizer. (However, it does provide nitrogen, see below). And, of course, there is a whole variety of poison baits, both powder and pellets, that you can use. Growers have been known to "paint" flower bearing branches with slug and snail powder poison for protection just before a flower show.

As a general rule, feed mature plants with 0-10-10 as early as February or as soon as the weather warms up in your area. Small flowering varieties bloom earlier than those with larger blossoms.

They need to be fed as soon as possible. If you don't have time to fertilize in phases, or simply prefer to do the whole job at once, try using 0-10-10 in the Fall to harden-off new growth. There will usually be sufficient nutrients remaining in Spring for good bud formation in small flowering plants without a separate feeding. The nutrient for root development and for bud development is the same.

A little planning can make a big difference in results. Old hands know from experience, or their records, which are early or late season bloomers and fertilize each accordingly. If you're just starting, you might buy a calendar with space for notes for each day. Note on it the date when a plant begins forming buds, and when it blooms. After a few years, you'll have a record of how each performs for you. Ideally, you want to fertilize with 0-10-10 or 2-10-10 about two weeks before bud formation begins, (eight to ten weeks before blooming). Bud formation will vary from year to year depending on weather. If a mature plant has formed buds do not use a growth promoting fertilizer (i.e. one providing nitrogen). There are growers that do not feed at all once buds develop, and restart feeding after flowering is over.

Because a cutting will not support a large flower until it has reached an appreciable size, you're better off feeding with growth inducing fertilizer such as 2-10-10 or small amounts of a slow release formula to stimulate new stems, instead of flowers. Avoid high nitrogen and "fast acting" nitrogen compounds. If you let the plant grow before forcing it to bloom, the flowers are more likely to be the proper size and form, and the plant's health will not be set back by the energy expended in blooming. Do not feed a rooted cutting for three months after it is potted.

Do not change a plant's orientation to the light once buds start to set. This may cause it to disbud. Once the buds are well set, it's possible to move a plant to a spot where it can be seen to best advantage, but undeveloped buds may not mature.

While inspecting plants for weeds and pests, remove broken, diseased or frost-damaged branches. A branch with no or very few live areoles is a candidate for removal. To help prevent spread of virus, it is a good idea to sterilize any cutter between cuts. A butane cigarette lighter is an inexpensive and convenient way to heat-sterilize blades between plants. However, it is overkill, but a propane plumber's torch is a safer method. Safer yet is to not cut at all but to snap off branches to be removed for cuttings or pruning.

If a cutting is not diseased or leathery, and you don't want to start a new plant, label it with the flower's name and bring it to the ESA raffle table. Be sure you use a waterproof marking pen. It's a bother to label each cutting as it is cut. For one thing, stems may be wet and repel ink. But, it's too easy to confuse cuttings from more than one plant if precautions are not taken. A simple solution is to use paper lunch bags. When you start working on a plant, write its name on the bag. Any decent cuttings can be placed in the bag and easily identified for labeling later. However, remember that "Sharpie" ink is not permanent and will eventually disappear with time. For best results, apply rooting compounds before a wound calluses over, which means soon after it is cut. If

you use the paper bag method above, it is very convenient to dip cuttings in hormone compound at the same time you label them. Put them back in the labeled bag to keep like kinds together.

The rule for watering is the same as always, do not let an epi get completely dry and prevent it from staying saturated for a long period. The key here is the amount of rain. If the epies are wet with rain or rain is imminent, and rain is better than household water, there is no need to water. If the epi mix is dry 1 inch down and rain is not forecast, it's time to water. If there has been excessive rain it might be time to cover the epies for a while, so they have the chance to dry a bit.

As a final note, this is not the time to repot Spring blooming varieties. If you must repot, you will forfeit blooms this season. Remember, epies bloom best with crowded roots.

## Highlights of Recent Meetings

**HIGHLIGHTS OF THE FEBRUARY 7th MEETING:** The scheduled speaker for this meeting was suddenly unable to attend, and will be rescheduled. So Jim Nones and Keith Ballard filled in with some epi culture procedures. Jim talked about epi culture in general, such as fertilization etc.

Keith felt compelled to talk about the unusual and unexpectedly high amount of rainfall this year, and its possible impact on our epies. This was because he had lost his whole collection in the last high rain year in the late 1980s. Lots of rain continuing over a number of days leaves the epi roots saturated with water, and over those days root rotting becomes a possibility. Ken Hanke noted that wild epies grow naturally in a rain forest, which often has lots of rain, but survive. Keith noted it's all about the drainage. Wild and in the rain forest, epies typically grow in fallen rotting leaves and bird droppings caught in the crotches of trees. There, the drainage is as close to perfect as one can get. We are forced to use pots for our epies. Many pots have just 4 holes in the bottom for drainage, not exactly the best one can do. Keith typically adds 4 more holes in the bottom and 4 holes in the sides, near the bottom to improve the drainage. The holes in the sides also let you pry the root ball out of the pot at repot time. He feels the additional holes would improve the drainage. During that 1980s heavy rain period, while other members were saying how good their epies looked, Keith was the only one in the society that lost epies, even with the additional holes. He had an infection of Florida Red Scale going on during this period, and it was felt that this weakened the plants and made them more susceptible to rot root.

**HIGHLIGHTS OF THE MARCH 7th MEETING:** For this meeting Jim Nones did a presentation about some German and French hybridizers. In 2014, when EpiCon was held in Los Angeles,

Dr. Rudi Dorsch presented a program of little known European hybridizers. It was compiled by German hybridizer, Rudolf Hessing. Jim asked Rudolf if we could revisit the presentation with a different audience, the ESA members. This time I wanted to know a little bit of information about these hybridizers as well as to reacquaint myself with their flowers. Emails were exchanged. I wanted to see their faces to associate them with their hybrids, and asked a few questions for a short profile, sort of "up close and personal." Three are from Germany, two from France. A couple of them I was familiar with, Thierry and Heiner, since they were somewhat active on facebook. Only 2 have registered their epies, but all have one thing in common. All five had a collection of flowering cacti beforehand, and a greenhouse.



**Arnhelm Lux**

**Arnhelm Lux**, a gardener by profession, raises flowers and plants for his flower shop that he manages. He has over 300 epies in his collection and over 20 registrations. A vegetable garden of varied tomatoes, chiles, and succulents fills out the yard. Arnhelm is obsessed with his favorite Finnish band, *Eläkeläiset*, who play a type of polka music that satirize popular songs. He named a flower for each of the season band member: 'Humppa Lassi', 'Humppa Martti', 'Humppa Onni', etc. A stand out is 'Humppa Pekka' which blooms several times a year. His Humppa hybrids collection is featured at "Botanical & Tropical Butterfly Garden" in Joensuu, Finland, the hometown of the band. He plans to add another 2-3 hybrids to his collection of registered hybrids. Arnhelm resides in Geisenkirchen, Germany.

**Hans-Gunther Noller** is 74 years old and has been growing epies and cactus since 1964. He did his first cross in 1990, and still does, but not as much anymore. Hans has not registered any of his hybrids, but hopes to do so in the coming year. He lives in Germany, near the France/Luxembourg border.



**Etienne Haugede** was given his first epi at the age of 9, and 10 years later in 1979, he started hybridizing. Two flowers he is proud of are a cross of *Disocactus phyllanthoides* x 'cooperii'. It produced a floriferous flower he named in honor of his supportive wife, 'Madame Isabelle Haugede'. The other, a cold and rain resistant flower, 'Chti Midas'. He collects epies from France and Germany.

**Etienne** writes in his own words: "I did not register any hybrids with the ESA for two reasons; I do not know the registration procedure, and I am very busy because of my profession as an optician. I have a lot of admiration for the ESA which classifies and records the existing hybrids in the world. I have, however, the fear that the registration of varieties very similar to those which already exist will saturate the nomenclature. At each hybridization, I systematically destroy all the plants which do not show a certain interest in their flowering. I think this is a difficult but necessary step to increase the diversity of hybrids." He is considering registering some this year. He hails from Mouvaux, near Lille, in northern France.



**Thierry Le Gallo**

Before he started collecting epies, French hybridizer, **Thierry le Gallo** was a collector of globular cacti. In 1998 things changed in his garden when a friend gave him two plants, an *Epiphyllum ackermannii* and *Disocactus phyllanthoides*. He was hooked and started hybridizing the two plants, but his lack of experience caused him to lose many seedlings. One of the few "survivors of his experiment," as he puts it, "gave him such joy" that he called it 'Bo Nielsen'. A couple of years went by and he started to buy epies all over the world. His second cross was 'Lemon Punch' x 'Whirlbird'. He states that his collection is over 250 along with his own hybrids. One of his latest crosses was with 'Princess Linda' x 'American Sweetheart', where he hopes to be rewarded with double flowers. "I love double flowers," Thierry writes.



**Heiner Duesterhaus**



**Heiner Duesterhaus**



**'Lady Due' - Duesterhaus**





***'Nina Due' - Duesterhaus***



***'Madame Isabelle Haugede' -  
unregistered Haugede***



***'Theresa Due' - Duesterhaus***



***'Jeanne Vizier' - unregistered Haugede***



***'Claire De Lune' - unregistered Haugede***



***'Marie Yvonne Le Gallo' -  
unregistered Le Gallo***





*'Humppa Lassi' - Lux*



*'Noller's Überraschung' x D. speciosus ssp. aurantiacus  
- Noller*



*'Humppa Onni' - Lux*



*'Noller's Überraschung' - Noller*



*S. anthyanus x 'Frühlingsahen' - Manglesdorff*



# Growing Epiphyllums from Seed (Part 2)

*A continuation of the basic manual from a presentation by Don Burnett*

Use a small or medium clear shoebox for germination. Any clear container with a lid will work. Early spring is the best time to sow seeds.



**An assortment of growing containers**

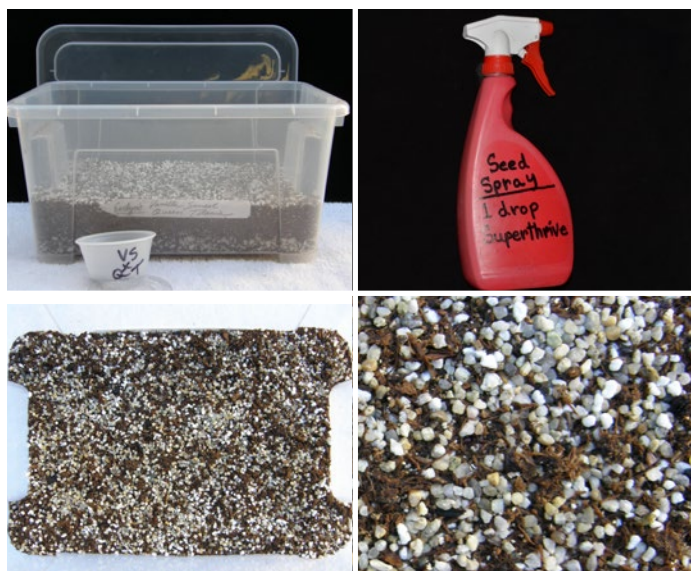
To prep the shoebox for seeds, compact Supersoil to approximately a 2" depth. You can now spread the seeds over the soil.

Some apply a small amount of charcoal over the seed bed. You can find this charcoal in a feed store. It is used for chickens or in a fish store, it is the kind of charcoal used in aquarium filters. I don't believe charcoal is necessary, but many people use it with success.

Fill a spray bottle with water. You may add a few drops of a liquid fertilizer and fungicide to the water.

Pour the water around the edge of the shoebox until you see the soil on the bottom start to absorb the water. Then spray the top of the seed bed. This will float some of the material in the Supersoil over the top of the seeds.

Make sure you put the label inside the shoebox so you can read it from the outside. Place the shoebox where it will get early morning sunlight. This will bring temperature up in the box and the seeds will begin to sprout in about 2-3 weeks. The box should not be set in a position so it will have direct sunlight on it all day or the new and tender seedlings will burn and die. The seedlings need light and warmth. They will grow toward light, so you will need to turn the box occasionally. You may have to



**(top left) Ikea box with mix; (top right) Spray Bottle; (bottom left) Seed mix; (bottom right) Seed mix close-up**

add water occasionally. Try and grow the seedlings in the same conditions as the rest of your epies.

Seedlings start with two cotyledons (seed leaves). They will develop 3-4-5 angle growth before settling down to a two or three angle branch.

## Germination



**A collection of seed boxes**

How long do you leave seedlings in a box before planting the seedlings in a flat? It depends on how long it takes the cross to reach 1 1/2 "-2" in the shoebox. Some crosses grow faster than others. You may wait six months or up to two years. One year is the average before they are ready to be transplanted into a flat.

## What is a flat?

A flat is made from 1" x 8" x 6' redwood fencing. Mine are approximately 20-22" square. Use the same redwood material for the sides and bottom. Nail the sides and bottom together using size 6 galvanized nails.





**(left) illustration of seedlings; (right) new seedlings**

Use the following ratios for soil:

Supersoil (six 1 gallon parts)

small perlite (one 1 gallon part)

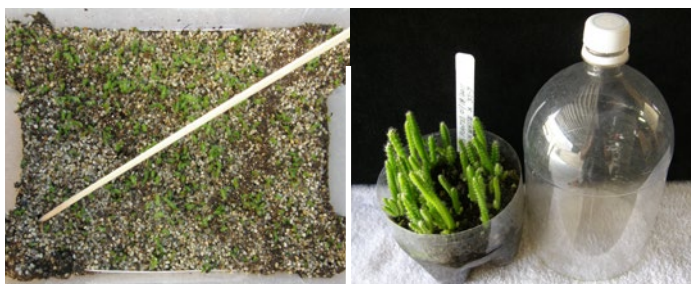
bone meal (one cup)

chicken fertilizer (one 1 gallon part)

slow release fertilizer (1/2 cup)

Fill the flat within 1/2" from the top and pack the soil as you fill.

A 2 x 4 or brick works well for compacting the soil.



**(top left) Two crosses separated by plastic; (top right) Soda bottle used for seedlings; (middle left) Group of seedlings; (middle right) Seedlings ready to transplant; (bottom left) Seedlings; (bottom right) Seedlings transplanted into flats**

### Planting seedlings into flat

- separate seedlings and pick the ones you like
- add several labels with the cross information
- use something the size of a pencil to make a hole and insert seedling a little deeper than it was in the shoe box.
- place the flat above the ground where they can grow until they bloom.
- water seedling flat



**(top left) Seedlings in a flat; (top right) Seedlings with multiple juvenile growth; (bottom left) More seedlings; (bottom right) Mature seedlings**

- use a water meter throughout the year until you get a feeling of water requirements for the flat
- spread some type of snail or slug bait on top of the flat.
- watch for caterpillars - they like epi seedling. (the ones I've seen are green).
- Add super soil as you remove seedlings

### When they bloom

Keep a log book. Take photographic records.

You may plant seedlings in a 7 or 8" pot and make cuttings. Label branch with cross numbers and place label in pot.

You can put all the seedling cuttings in one 8" pot along with the parent seedling or treat cuttings the same as any others.

Hang the pot with other epies. Watch the water at first - treat it like your other epies.

Hopefully it will bloom again the next year, but most probably in two years.

You have plenty of time to think up names.

Good luck, Don Burnett (DB) 2003



# Epi Fertilizer Guide

By Keith Ballard

***This is a reprint from Vol. 64 No. 3, (2009). It is probably too long for just one Bulletin. However, the contained information would be most helpful early in the year, so it is all included herein. KCB***

As we come into spring, many an epi grower's thoughts turn toward fertilization. Briefly, the usual epi fertilization advice we give is: apply 0-10-10 before blooming and during flowering in the spring, and something balanced during the summer such as 8-8-8. However, what do the numbers mean and are these an optimum choice?

Fertilizer is not plant food. Plants use water, carbon dioxide, elements from fertilizer, and energy from the sun to produce their own food. Synthetic (manufactured) and natural (sometimes incorrectly called organic) fertilizers provide nutrients for plant growth. Addition of the correct amount of the correct fertilizer can promote healthy flower production and foliage growth while an excessive, and/or inappropriate type of fertilizer can decrease plant health and can lead to decline and death. Excess fertilizer can increase the likelihood of some plant diseases or has the risk of making the epies fertilizer "junkies," which will "crash" if the excessive application were to stop. The following is a brief discussion of the constituents of fertilizers and what they do for epies. However, keep in mind that fertilization alone will not generally "cure" a sick plant.

## PLANT NUTRIENTS

Plants require 17 elements for normal growth. Carbon, hydrogen, and oxygen are found in air and water. Nitrogen, potassium, magnesium, calcium, phosphorous, and sulfur are absorbed from the soil. The latter six elements are used in relatively large amounts by the plant and are called macronutrients. There are eight other elements that are used in much smaller amounts; these are called micronutrients or trace elements. The micronutrients include iron, zinc, molybdenum, manganese, boron, copper, cobalt, and chlorine. The nutrients that are most likely to limit plant growth are nitrogen, phosphorus, and potassium. These latter 3, in this order, are the ones whose percentages are on the typical fertilizer package label.

**Nitrogen (N)** is a primary component of proteins, and is a part of every living cell. This nutrient is usually more responsible for increasing plant growth than any other nutrient. Shortages can cause slow growth, reduced branch size, yellowing and increases the likelihood of some diseases. An overabundance can cause excessive shoot and foliage growth, reduced root growth, low plant food reserves, and increased susceptibility to environmental stresses and some plant diseases.

Nitrogen is a mobile nutrient, it is in constant motion. Nitrogen applied to the soil can be used by plants, washed off the soil surface, lost to the air as a gas, or leached through the soil. Nitrogen loss is higher when a heavy rain immediately follows a surface application of fertilizer. Incorporating fertilizer into the soil or lightly watering (1/4 to 1/2 inch) after making a surface application will reduce the amount of nitrogen loss.

As a caution for epies, high levels of soil nitrogen just before blooming season will promote branch growth but reduce flower production and size.

**Phosphorus (P)** plays a role in photosynthesis, respiration, energy storage and transfer, cell division, and cell enlargement. It promotes early root formation and growth, and the production of flowers, fruits, and seeds. The form of phosphorus in the typical fertilizer is actually phosphoric acid, which will modulate the pH level of the mix. See the discussion on pH later in this article.

When applied as fertilizer, phosphorus is quickly bound by soil particles. Phosphorus is extremely immobile in soils (except sand); it moves about 1 inch from its original placement. Unless phosphorus is incorporated into the soil or watered in, plants may not be able to use it.

**Potassium (K)** is involved in many plant growth processes; it is vital to photosynthesis and helps regulate water in plants. Potassium fertilization helps plants overcome drought stress, increases disease resistance, and improves winter hardiness. Potassium can be leached through the soil by water, but not as quickly as nitrogen.

**Nutrient Uptake by Plants** Nutrients in the soil can be in a solid form (from granular fertilizer, liquid fertilizer or organic matter), attached to the soil particles or dissolved in soil water. For an element to be absorbed by plants, it must be in a form the plant can use, and present (dissolved) in soil water. Water and oxygen are required for nutrient movement into plant roots. Without adequate oxygen in the soil, there is limited nutrient absorption. Anything that lowers or prevents the production of sugars in the branches can lower nutrient absorption. If the plant is under stress due to low light or extremes in temperature, nutrient deficiency problems may develop even though adequate nutrients are available in the soil solution. Diseased or damaged roots, improper soil pH, water-logged mix, and plantings that are too deep can result in inefficient nutrient absorption. Adding fertilizer under these conditions will not enhance plant growth, and may actually cause plant damage.

The stage of growth or how actively the plant is growing may also affect the amounts of nutrients absorbed. Epies go into a rest period, or dormancy, during periods of cold weather. During this dormancy few nutrients are absorbed.

**Soil pH** is a measure of the hydrogen (acid-forming) ion activity of the soil solution. The scale contains 14 divisions known as pH units. It is centered around pH 7, which is "neutral." The term neutral means that the acid and alkaline are present in equal concentrations. Values below 7 constitute increasing acidity (acid range of the scale), and values above 7 make up the alkaline range.

The pH scale is not a linear scale but a logarithmic scale. A soil with a pH of 8.0 is ten times more alkaline than soil with a pH of 7. A soil with a pH of 4.0 is ten times more acidic than soil with a pH of 5.0, and 100 times more acidic than a soil with a pH of 6.0. The pH range for epies is 5.5 to 6.5 (generally called slightly acidic).

The major impact pH extremes have on plant growth is the availability of plant nutrients. For example, if the pH drops as low as 5.0, the phosphorus combines with soil iron and is not readily available to most plants. A low pH also reduces the activity of soil

organisms that decompose organic matter. Low soil pH can be altered by applying lime. A pH of 4.0 or lower is fatal to most plants. If you are interested in knowing the pH of your mix, there are a number of relatively low cost meters that will measure pH available both in nurseries and on the Internet.

### FERTILIZER TERMS

**Fertilizer:** Any material used to supply one or more of the essential plant nutrients. **Fertilizer ratio:** The relative proportion of N, P, and K. 16-4-8 fertilizer has a ratio of 4:1:2 or 4 parts nitrogen to 1 part phosphorus to 2 parts potassium.

**Balanced fertilizer:** A fertilizer containing equal parts of each major element, i.e. 10-10-10.

**Complete fertilizer:** A fertilizer containing nitrogen, phosphorus, and potassium. Examples of commonly used complete fertilizers are 10-10-10, 16-4-8, and 12-4-8.

**Incomplete fertilizer:** A fertilizer missing one or two of the major elements, i.e. 0-10-10.

**Fertilizer analysis:** The minimum amount of each element in a fertilizer as stated on the label.

**High analysis:** A fertilizer containing 30 percent or more active nutrients, i.e. ammonium nitrate 33-0-0. The cost per bag is usually more but the cost per pound of nutrient is less (therefore the cost for fertilizing a given area is less).

**Types of Fertilizers** All fertilizers are labeled with three numbers, giving the percentage (by weight) of nitrogen (N), phosphorus (P2O5), and potassium (K2O). A 100 pound bag of fertilizer labeled 0-20-10 has 0 pounds of nitrogen, 20 pounds of phosphorus, 10 pounds of potassium, and 70 pounds of filler. Filler is added to make the fertilizer easier to spread and to reduce the likelihood of burning plants with too much fertilizer. A fertilizer may contain secondary nutrients or micronutrients not listed on the label.

The diversity of fertilizer types and brands can be overwhelming when you go to make a purchase. Generally speaking, the timing and rate of application are more critical than which fertilizer you purchase. The most important issue is the type of nitrogen in the fertilizer you purchase. Most fertilizers contain nitrogen in a quick release form (10-10-10 and 8-8-8), others are in a slow release form (16-4-8, 12-4-8). Some are a combination of both. Quick release forms of fertilizer are immediately available, but do not last as long and can cause plant damage if a large application is made.

Ammonium nitrate, ammonium sulfate, calcium nitrate, and potassium nitrate are all water soluble, quick release forms of nitrogen. The nitrogen becomes available as soon as it comes in contact with soil water. Urea is an organic form of nitrogen but it is also quickly converted to nitrate nitrogen. High application rates combined with high irrigation or rainfall can result in large amounts of nitrogen being leached to below the root zone.

**A slow-release fertilizer** releases nutrients at a rate that makes them available to plants over a long period. Slow-release fertilizers need not be applied as frequently as other fertilizers and there is less potential of leaching into ground water. The initials W.I.N. and W.S.N. on fertilizer

labels stand for water insoluble nitrogen and water soluble nitrogen, respectively. Water soluble nitrogen dissolves readily and is usually in a very simple form, such as ammonia nitrogen or nitrate nitrogen. Water insoluble nitrogen is referred to as a slow release nitrogen source. Nitrogen which will not dissolve readily is usually in an organic form of nitrogen (with the exception of urea) that must be broken down into simpler forms by soil microorganisms before it can be used.

Sulfur-coated urea is a slow-release fertilizer with a covering of sulfur around each urea particle. Different thicknesses of sulfur control the rate of nitrogen release. Watering does not affect its release rate. Sulfur-coated urea applied to the soil surface releases nitrogen more slowly than if incorporated into the soil. This material generally costs less than other slow-release fertilizers, and it supplies the essential element sulfur. Some fertilizer products are coated with multiple layers of resin. When they come into contact with water, the layers swell and increase the pore size in the resin so that the dissolved fertilizer can move into the soil. Release rate depends on the coating thickness, temperature, and water content of the soil. There is often a large release of fertilizer during the first 2 or 3 days after application. Release timing can be from 0 to 12 months, depending on the coating.

### NATURAL FERTILIZERS

Natural fertilizer materials can serve as effective fertilizers, but only if their nutrient contents are known and their mineralization rates are estimated closely. The advantages and disadvantages of natural and synthetic fertilizers relate to the consumer, not to the plant. Natural fertilizers are mostly complex chemical substances containing carbon. In general, natural fertilizers release nutrients at a slow rate over a fairly long period. This can be advantageous for perennial crops, since only one large application may be needed.

Most natural materials are far less predictable in nutrient content, nutrient release, and nutrient efficiency than commercial grade fertilizers. Before most organic nutrients can be absorbed by plants, they have to be broken down to an inorganic form by soil microorganisms through a decaying process called mineralization. This process is affected by moisture, temperature, and the microbial species and populations in the soil. Most organic materials are effective only when the soil is moist and soil temperature is warm enough for the soil organisms to be active. They may not release enough of their principal nutrient at a time to give optimum plant growth.

When packaged as fertilizers, natural fertilizers will have the nutrient analysis stated on the labels. Some organic materials, particularly composted manures and sludges, are sold as soil conditioners and do not have a nutrient guarantee (small amounts of nutrients may be available). Most natural fertilizers are high in only one of the three major nutrients; many are low in all three.

Natural fertilizers can be expensive if applied in amounts adequate to supply nutrients for good plant growth; however the value for improved soil structure should be considered. The nutrient content may need to be supplemented with other organic or inorganic materials to achieve a balanced ratio of nutrients.

How much to use varies with the nutrient content of the material. The age of the material is also a factor; when organic material



decays and is rained on, they lose nutrients, especially potassium and to some extent nitrogen. Fresh manures may cause plant injury, especially when large quantities are used.

### EXAMPLES OF NATURAL FERTILIZERS

**Cottonseed meal** is a byproduct of cotton manufacturing. As a fertilizer, it is somewhat acidic in reaction. Nutrient content varies slightly but generally contains 7 percent nitrogen, 3 percent phosphorus (P2O5) and 2 percent potash (K2O). Nutrients from cottonseed meal are readily available to plants in warm soils, and pose little danger of burning. For general garden use, apply 2 to 5 pounds per 1,000 square feet. The nitrogen is slowly made available. Cottonseed meal is frequently used for fertilizing acid-loving plants such as azaleas, camellias, and rhododendrons.

**Blood meal** Dried blood is a byproduct from beef processing. As blood is drained from recently killed animals, it is dried and ground into a powder. It is a rich source of nitrogen, perhaps too rich for epies, but supplies certain essential trace elements including iron. The gardener must be careful not to use more than the amount recommended on the label.

**Bone Meal** Bone meal, finely ground bone is used as a fertilizer for its content of phosphate and nitrogen (about 23%-30% available phosphate and 2%-4% nitrogen); it is an expensive form of phosphoric acid when compared with super phosphates. However,

the phosphate is available so slowly, most epi growers have given up on its use, but hybridizer Gerry Mattijetz contends that bone meal helps to keep the planting mix "sweet."

**Fish emulsion** is a partially decomposed blend of finely pulverized fish. The odor is intense, but dissipates within a day or two. Fish emulsion contains up to 5 percent readily available nitrogen and is a source of several trace elements. Contrary to popular belief, too strong a solution of fish emulsion can burn plants, particularly those in containers.

**Animal manure** is also a complete fertilizer but is low in nutrients. Manures vary in nutrient content according to the animal source and what the animal has been eating. A nutrient ratio of 1-1-1 is typical. The amount of nitrogen in manure varies but is normally around 0.5 percent (poultry litter is higher in nitrogen). This is 1/20 of the nitrogen found in an equal amount of 10-10-10 fertilizer. Commonly available manures include horse, cow, chicken, and sometimes sheep. The actual nutrient content varies widely. The highest concentration of nutrients is found when manures are fresh. As it is aged, leached, or composted, nutrient content is reduced. Fresh manure should not be used where it will contact tender plant roots. Manures are good soil conditioners. Manures should be incorporated into the soil to conserve nitrogen. If left on the soil surface, up to 25 percent of the ammonia nitrogen can be lost within 2 days and 75 percent or more can be lost within 1 month after application.

| 6" Pots, New Mix Results (no 0-10-10 was added to the Control sample pot) |            |           |           |        |                           |
|---------------------------------------------------------------------------|------------|-----------|-----------|--------|---------------------------|
| Date                                                                      | Control pH | 1 tsp. pH | 1 Tbs. pH | Liquid | Test Condition            |
| 3/15/07                                                                   |            | 4.2       | 3.8       | 4.5    | Added 0-10-10             |
| 3/21/07                                                                   | 6.4        | 5.5       | 4.2       | 4.5    | Nothing added             |
| 3/24/07                                                                   | 6.5        | 5.5       | 4.0       | 6.5    | Watered before test       |
| 3/27/07                                                                   | 6.3        | 5.4       | 3.5       | 4.9    | Added liquid 0-10-10 only |
| 3/30/07                                                                   | 6.0        | 5.5       | 4.6       | 4.6    | Nothing added             |
| 4/10/07                                                                   | 5.5        | 5.0       | 4.6       | 5.3    | Nothing added             |
| 5/05/07                                                                   | 6.5        | 6.0       | 5.5       | 6.5    | Nothing added             |

| 'Calisto' and 'Sunset Blvd' Results |              |                  |                                   |
|-------------------------------------|--------------|------------------|-----------------------------------|
| Date                                | 'Calisto' pH | 'Sunset Blvd' pH | Test Condition                    |
| 3/31/07                             | 6.0          | 6.0              | Initial, nothing added            |
| 3/31/07                             | 5.5          | 6.1              | 1 tsp. 0-10-10 added to 'Calisto' |

**Sewage sludge** is a recycled product of municipal sewage treatment plants. Two forms are commonly available: activated and composted. Activated sludge has a high concentration of nutrients (approximately 6-3-0), and may contain significant amounts of lime. Composted sludge is usually sold in a dry, granular form for use as a general purpose, long lasting, nonburning fertilizer.

Composted sludge is used primarily as a soil amendment and has a lower nutrient content (approximately 1-2-0). There is some question about the long term effects of using sewage sludge products. Heavy metals, such as cadmium, are sometimes present in the sludge and may build up in the soil. Possible negative effects vary, not only with the origin of the sludge, but also with the characteristics of the soil where it is used. It would be desirable to have the sludge analyzed for heavy metals before use.

### Specific Fertilizer Recommendations for Epies.

OK enough background. Here are some specifics for epies. George French once told Galen Pittman to never use a fertilizer with a **nitrogen content** higher than 8.0% (Herein called the 8% rule). Also remember, epies are known not to be heavy feeders.

Accepting the 8% rule for the nitrogen limit, next to be considered is the **phosphorus content**, because of its impact on the pH. The acceptable pH range for epies is 5.5 to 6.6. Reprinted below are the results from some tests I did with some 0-10-10 in new mix in two 6" pots (1 for testing and 1 for Control) and with 2 plants in 8-1/2" pots, with a dry granular slow release product and with a liquid version.

### Conclusions:

The original mix's pH is in the acceptable range. 0-10-10 does indeed drive the pH more acidic, more fertilizer drives the pH even lower; with time (and watering) the pH drifts up, slowly for the dry fertilizer and more quickly for the liquid; and a teaspoon of 0-10-10 only drives the 8-1/2" pot (which has roughly 2.5 to 3 times the volume of the 6 inch pot) one half point of pH. The results are not totally consistent probably because the sample size is too small.

|                                                                                                                          | Measures of Nitrogen(N) | Measures of Phosphorus(P) | Measures of Potassium(K) |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------|--------------------------|
| "SureStart"                                                                                                              | .05                     | .20                       | .10                      |
| "Care"                                                                                                                   | .10                     | .10                       | .06                      |
| Total (In 2 measures)                                                                                                    | .15                     | .30                       | .16                      |
| We now have 2 measures of mixed fertilizer. For 1 measure we divide these numbers by 2 where the element numbers become: |                         |                           |                          |
|                                                                                                                          | .075                    | .15                       | .08                      |

What is the overall conclusion? 10% phosphorus and around 1 teaspoon per 8-1/2" pot is safe enough and probably the right thing to use. I start on Ground Hog Day (mid-winter) and apply every 6 weeks until the end of flowering or the first of June, whichever comes first.

If a particular plant is not growing as you like, a little nitrogen in a 2-10-10 might be of some help and not noticeably effect the flowering. However, I have a story on an excessive amount of phosphorus. Some time ago, I had a 'Wicked Witch O' East', and I waited for years for it to bloom. Before I threw it out, I gave one more try using some 11-40-6 in instead of the usual 0-10-10. The plant bloomed that year and in the following years when I returned to the 0-10-10.

As a final note here about liquid 0-10-10, Liquinox Co. makes a liquid 0-10-10 which is (as stated on the container) straight phosphoric acid and has a pH of 0.4. As such, it is around one million times more acidic than the limit for epies. As the above table shows, liquid fertilizers are more quickly available to plants and also disappear more quickly. I have used it at 1/2 tablespoon per gallon of water, but I would caution against much higher concentrations.

There seems to be no data on the limits of optimum **potassium or micronutrients content**, so there are no recommendations.

Thus, the recommendations we have been giving for some time are correct, with 0-10-10, at the times described above and 8-8-8, or maybe 8-10-10, used around the first of June and the first of September, at a rate of about a teaspoon per 8-1/2" container.

### DESIGNER FERTILIZER

With all the fertilizer choices we are offered we still may not get what we want.

Many of today's slow release fertilizers are actually **blended**. The various manufacturers make small granules of the various elements in the fertilizer, such as one for nitrogen, one for phosphorus and so on. Then, they blend the correct quantities of the various element granules together to get the ratio of nutrients they desire. With this approach, they can easily tailor a optimum fertilizer for a number of specific plant families using the same building blocks for all. This approach minimizes the number of different things to be manufactured and therefore cuts costs.

Using this same approach, we can blend our own tailored fertilizer. An example follows. I have on hand two GreenALL Company fertilizers:

"Sure Start" 5-20-10 (For starting new plants and grass)

"Care" 10-10-6 (For azaleas, gardenias and other acid lovers) So with 1 measure of each we have:

Converting the numbers to a percentage (multiply each by 100%) to look like those on a fertilizer label, we now have a 7.5-15-08 fertilizer. I would test the pH impact of the 15% phosphorus on the real mix If you used other than one measure of each original fertilizer (and you can use more than two). Be sure to scale the element numbers to match. For example, if you used a 1/2 measure of "Care," its element numbers become: N (.05), P (.05) and K (.03).

If you remember your high school math, what we are really doing here is averaging the percent numbers of each element, which you can probably do in your head.



As a final note, "Care" is now no longer available, which sometimes happens, and I am using Vigoro's "Bold Blooms" at 15-30-15 and "Sure Start." One quarter of a measure of the "Bold Blooms" plus 1 measure of the "Sure Start" gives fertilizer numbers of 7-26-11, and the epies seem to "like" it.

Much of the general horticultural and technical information in this article is based upon one found on the internet, entitled "A Gardener's Guide to Fertilizing Trees and Shrubs", by Ery Evans, Consumer Horticulturist, NC State University. KCB

## Culture Corner

# The Benefits of Worm Castings

*By Geneva Coats*

Two years ago we enjoyed a presentation about dahlias at our monthly ESA meeting. This is a fascinating flower with which I have had absolutely zero previous experience. The speaker was Bob Papp, and his enthusiasm was infectious. A myriad of bloom forms and colors have been developed by hybridizers. Bob informed us that there are over 7000 show classes available for those who show their dahlia flowers. Bob admits, however, that when epiphyllums are in bloom, they tend to divert attention away from their rivals, the dahlias.

To my way of thinking, no flowers are more beautiful than the somewhat wild, free and exotic blooms from tropical plants like epiphyllums, plumeria and hibiscus. But, dahlias have a nice sort of formal appeal all their own too. Hey, they even have a flower form that they have dubbed "cactus;" I suppose imitation is a form of flattery. We epi growers know that few plants can compare with the cactus family for the iridescent and breathtakingly majestic quality of the blooms.

Bob related some of his successes with the use of organic gardening methods on his dahlias. Non-toxic pest control is a goal of organic gardeners, as is the use of more natural forms of fertilizers instead of chemical fertilizers. Bob is sold on the benefits of worm castings in the garden.

Worm castings, a type of compost made from green waste that is digested by worms, is available commercially or you can cultivate your own supply at home. Worm farming is a great way to speed up the production of usable loam from green waste. While it may take months to years to obtain results from a compost heap, earthworms speed up the process considerably, and the products of earthworm digestion contain many benefits not found in compost alone. In addition to feeding green waste to earthworms, worm farmers may substitute animal manure or paper pulp to satiate the appetite of their wiggling garden assistants. The nutrient composition of the end product (known as "worm castings" or "vermicompost") varies depending on what type of feed the worms have been munching.

So with the thought of bigger, stronger plants with more flowers and greater resistance to pests of the newer, fancy hibiscus hybrids, and have also joined the American Hibiscus Society, this has been a great way to gain a new perspective on horticulture from another group of gardeners. The hibiscus growers rave about the benefits of worm castings. They claim that this material not only improves the soil, but provides nutrients and helps to repel insect pests. Hibiscus are notorious magnets for white fly, but with the use of worm castings in the soil, it is claimed that the plants develop a sort of resistance to white fly. The grower here in California from whom I ordered some plants and supplies includes worm castings in their custom soil mix in a ratio of approximately 10%. I have to admit, their plants look great and so far no whitefly or other insect pests have become a problem with the plants I obtained from them. Meanwhile, a large garden hibiscus in my yard has had a long-standing whitefly infestation, but so far, the pests have not spread to these other plants treated with worm casts in the soil. I just added worm castings to the soil of my big garden bush so we'll see how that works out.

Meanwhile, I'd heard from an epiphyllum grower that worm castings were a potentially valuable product to help battle scale infestation. Being somewhat skeptical by nature, I decided to look for available research to support such claims. There have been many studies done as far back as the 1960s, and there is ample research available on the many horticultural benefits of worm castings. I'll try to summarize those benefits here for you.

Organic materials are converted by earthworms into rich soil amendments with greatly increased microbial activity and nutrient availability. Worm castings provide humus, which makes soil crumbly and gives it the light loamy texture that plants love. Humus in the soil stimulates root growth and reduces stress. Humus helps to retain nutrients and releases them slowly as plants need them.

Vermicompost contains mineral elements in forms that are readily available to plants. The percentages of macronutrients and trace elements vary somewhat depending on what the earthworms are fed, with lowest elemental concentrations recorded in those raised on municipal waste compost, and larger amounts available in earthworm-processed animal waste. Studies show that vermicompost improves soil structure, fertility and fruit yields in comparison with use of inorganic fertilizers. Plants provided with the addition of worm castings have noticeably better growth of roots, leaves and stems. Root lengths and numbers increase.

Greenhouse and field studies demonstrate consistently positive effects on plant germination, growth and yields. Even soils that contain just 5% worm casting composition produce dramatic growth responses in test plants. And, the effects are long-lasting. One study showed that a single application of vermicompost to grapes still had positive effects on yields for five years. Another study on cherries found that one application of worm castings increased the yield of cherries in an orchard for three years.

Researchers found that the growth increases that occurred in all of their experiments were much too large to be explained purely on the basis of the nutrient contents of the vermicomposts. They also noticed

dramatic improvements in rooting, intermodal lengths and flowering. Upon investigation, they found high levels of plant growth-influencing hormones like cytokinins and auxins in vermicompost. Worm castings are very high in microorganisms, and bacteria, fungi, yeast, actinomycetes and algae are capable of producing plant growth hormones such as auxins, gibberellins, cytokinins, ethylene and abscisic acid in appreciable quantities. Researchers have further found that these plant growth regulators can be taken up by plants from soil in sufficient quantities to influence plant growth.

The microorganisms in worm castings produce antibiotics which can help plants fend off diseases. Worm castings provide protection against damping-off and rot. They have been shown to inhibit fusarium and verticillium wilt. A 2010 study found that worm castings "significantly reduced the "Yellow Vein Mosaic" virus and the fungal diseases "color rot" and powdery mildew".

But the most impressive claim, backed by research, is that the use of worm castings will repel sucking insect pests such as white fly, aphids, spider mites, and fruit flies. A company that applied for a patent for their worm casting product showed that worm castings possess distinct properties, which makes them effective for use as an insect repellent.

The element believed to be responsible for this effect is an enzyme known as "chitinase". Chitinase dissolves chitin, the substance that comprises the exoskeleton of most insects. The digestive system of earthworms produces the enzyme chitinase and it is found in high levels in worm castings. If earthworms are given foods rich in chitin (like the shells of lobster, shrimp and crab as well as some plants like mushrooms) their digestive glands will produce more of the enzyme chitinase. Some companies are feeding their worms a chitin-rich diet and find that it boosts the chitinase content of the worm castings considerably.

According to the patent information, "When worm castings are put into the soil of the plant feeding area (stem to drip line) the evidence indicates that the worm castings activate an increase in the internal concentration of chitinase." If an insect feeds on the stems, branches or leaves of a plant with high levels of chitinase, it will be killed.

This no doubt explains how hibiscus grown in media that contains worm castings may be less susceptible to white fly, and how the use of worm castings for epiphyllums renders them less susceptible to scale, our most persistent epiphyllum pest.

Ants have an aversion to earthworm castings and will avoid walking on them. Perhaps during blooming season, the addition of a layer of worm castings as a soil topper may help deter ants from accessing our epiphyllum flowers.

The larger the plant, the more time it takes for the plant to build up significant levels of chitinase to repel sucking insects. If you are so inclined, a 'tea' can be brewed using a cup of earthworm castings in a gallon of water. The resulting liquid can be applied as a foliar spray.

So if the thought of bigger, stronger plants with more flowers and greater resistance to pests and diseases appeals to you, give worm castings a try! You just might find the investment to be very rewarding!

There are many companies that offer the product for sale, such as Worm gold, Alpaca Gold, and Black Gold. I think we may have gotten some answers from the guy who is the representative from Worm Gold. He spoke at San Diego's meeting last Wednesday. They mix the castings with kelp and pumice and offer it for sale like that. There must be a benefit to the mix but I'm not sure what it is. I saw their bags for sale at San Gabriel Nursery a few weeks ago. Black Gold brand mixes their castings with peat moss. I don't know the exact proportions though. "Gardens Alive" website offers what they claim is 100% pure worm castings.

Interestingly, golf courses consider worms and their casting to be a nuisance. Earthworms find conditions of moisture and thatch on golf courses attractive and can build up a large population over time. They tend to leave castings on the surface of the turf, and they sometimes cause pits and mounds in the playing area. Course owners often try to reduce their earthworm populations. Hey, they should just bag it up and offer it for sale in the gift shop. It can go for quite a bit!!

## Epi Care Changes: Do They Help or Hurt?

*by Keith Ballard*

Like it or not, we all sometimes have to make changes in our epi care, even if we are not experimenting. Much of the time, changes are forced on us due to a change in a product we have been using. Take for example the evolution of the planting mix use. Historically, epi mixes included both peat moss and leaf mold. We became aware that peat moss was hard to wet, and almost impossible to rewet if it ever dried out in a mix. When it was reported that the world supply of peat was near depletion, we substituted coir for peat moss and it seemed successful. Later In California, when the Oak Blight was killing Oak trees, and the state actually seized all the leaf mold even from the nurseries, we kept the coir and added something else like a commercial potting mix or a fertilizer. We knew that something else would be necessary as coir is slightly acidic, as our epies require, but has no nutrients, so it was it and we used it.

When we make changes forced by product changes or as experiments to make our epi collection "better," there are two questions: 1) Is the result better (or at least the same as before)? 2) How do we know one way or the other? For example, in 1998, Raymond Eden, then the ESA President and Bulletin Editor, reported that the use of "wetting agents" on epies was "less than satisfactory" and "stopped their use to save his plants." That's the kind of result one would like to avoid.

There are some practical rules to follow in making changes. **The**



**first rule is to try the change on the smallest sample possible**, and the more radical the change the smaller the sample should be. I have written a couple of times about a limited herbicide called Ice Plant Weed Killer (available from Armstrong Nurseries). In spraying around the epies, some spray will inevitably get on the epies. So what is the impact? Spraying an epi with an herbicide does not sound like a very good idea. To see the result I sprayed ONE epi (which had lost its' name and therefore was expendable). The weeds died and the epi did not seem to mind at all. Thus, Killer is OK.

**The second rule is to try one change at a time.** With more than one change at the same time, one cannot separate what change generated what result.

In a way all changes, forced or not, are experiments. **So for any change or experiment, one should have a goal and a way to measure it.** For example: you try a new fertilizer. Your goal is healthier plants and more flowers. After some time you feel that the plants look better and you think there are more flowers. However, formalizing your feelings into something concrete like a numeric assessment of "better" is not easy.

To go on with this thought, what follows is a potential way to quantify the results of a new fertilizer. Healthier epies usually have more flowers, so let's make increasing the total number of flowers the goal. When you think about it, counting the total number of epi flowers is an impossible task. They usually bloom over a time period. Already counted but still fresh blooms would have to be marked. Faded blooms would have to be recorded and the whole thing would have to be done daily. At any rate, implied in this story, you have to keep records. In addition, keep in mind that the weather has its own influence on the results, for better or worse. This influence can only be guessed at.

Here's what I did for the real case of a new fertilizer. I started by using what might be called a pseudo count for the total number of blooms. Is it the real total number of blooms? Probably not, but used consistently it will be OK for comparisons. On the first day of an open bloom on a given plant, I first knock off any buds which clearly are going to drop. They have a funny red color and will come off at the slightest touch. I then count the open bloom and all the other buds. If there are tiny buds along with the much larger buds, I count every other tiny bud, to allow for more bud drop. The total number is recorded as the blooms for the year. If a given plant generates a true second set of one or more blooms later in the year, I record separately that number in also. At the end of the blooming season, I divide the total of number of blooms by the total number of blooming plants and get the average number of blooms per plant. You remember from high school, this is how you calculate a average. If the average number of blooms increased from when you started, then the new fertilizer is a success.

**Now for some real results.** The new fertilizer is the one I called a "Designer Fertilizer," whose analysis was 7.5-15-8, and which I created by mixing two commercially blended fertilizers as described in the article in this Bulletin: "Epi Fertilizer Guide." The data is from 2008, when the average number of booms per plant was: 4.56

and for 2010 (to date) the average was: 5.78. The mix was a coir mix, and is the same between 2008 and 2010. The result is a 27% increase in the number of blooms; that's wonderful! An increase in blooms, and I think that they look bigger as well. For the year 2010, Southern California has had below normal temperatures and a gloomy spring and summer, one would think this would have a negative impact on the flowers. Thus, I would guess the good results are not just weather influences. This fertilizer was used for years until two years ago, including a change in the manufacturer of the high nitrogen component. Then we had a presentation by a Kellogg Garden Products representative on their all organic products. As a result of the presentation, even though it was late in the repotting season, I bought some Kellogg "Shade Mix for Acid Loving Plants," and their one and only 7-5-7 fertilizer and repotted a number of plants with a mix of 1 part Kellogg and 1 part coir and used the Kellogg fertilizer. The perlite and bark were the same as before.

As the year progressed, I noticed that the plants repotted with the Kellogg products were growing at a much faster rate than those with the previous fertilizer, and I wondered if the flower production would be impacted. Well you may remember that in the winter of 2015-16 the temperature cycled between nice and warm and not so warm, and we effectively did not have a winter. So the epies did not get to rest. As a result, at the annual ESA show flower production was about ½ normal. For the epies repotted with Kellogg products, the blooms per plant varied from 0 to 6 (in one case) with most having 0 or 1 bloom. That's a little less than the repotted plants with the original mix, but with the weather changing like it did, the comparison may not be valid. In the fall of 2016 in Southern California, we abruptly and pretty much without warning, went from 5 years of drought to record rain, 18.5+ inches so far, which is greater than the so called historic maximum of just over 16 inches. It's April and it is still raining, but less frequently and less precipitation than earlier in the year.

One thing that's good and bad also happened last year. **Leaf mold is back on the market** (that's good), but it's twice as expensive as before (that's bad). Last year I repotted a number of plants with different mixes that included some with Kellogg "Shade Mix" and leaf mold. The blooming results will be in the Autumn Bulletin.

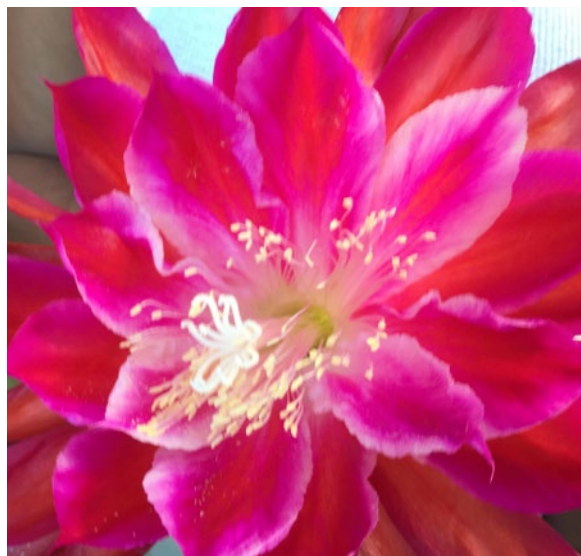
# New ESA Flower Registrations For 2016



**'Angel Falls' - NONES**



**'Aristeo' - DP**



**'Aristeo' - DP**



**'Atreus Paetz' - HP**





**'Atreus Paetz' - HP**



**'Atreus Paetz' - HP**



**'Bella Due' - HD**



**'Bella Due' - HD**



**'Ceramic Silk' - MIY**

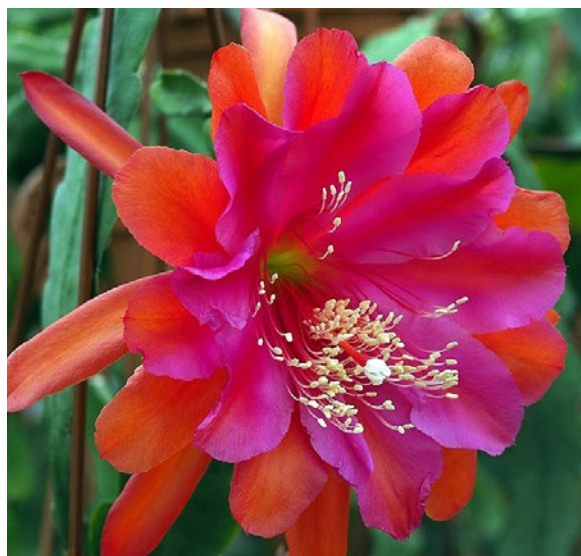




**'Clarity's Abraxas' - SLL**



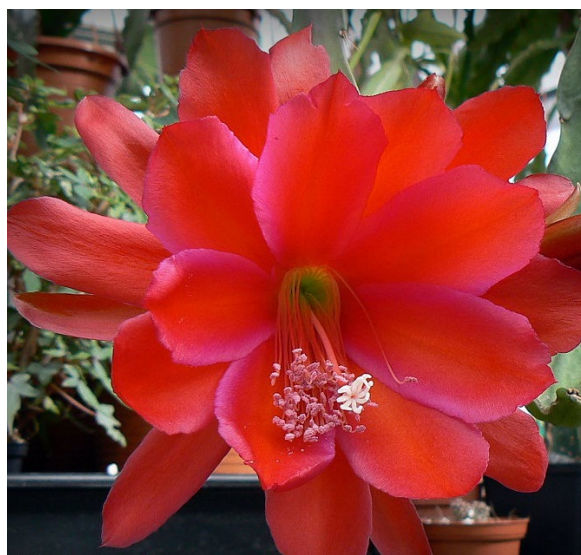
**'Clarity's Jaynellan' - SLL'**



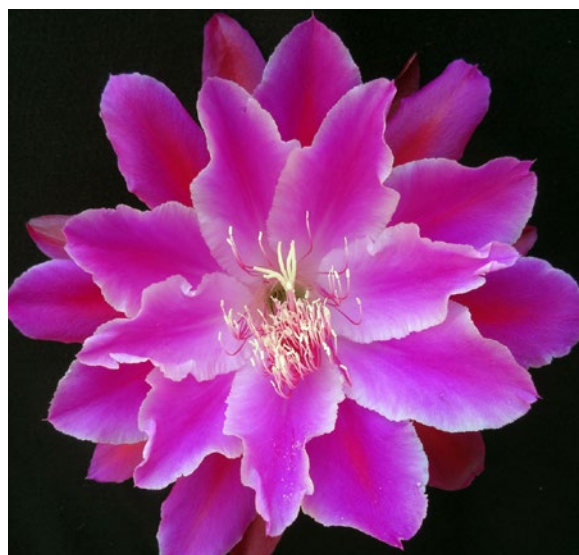
**'Clarity's Antigone' - SLL**



**'Clarity's Neon Spark' - SLL**



**'Clarity's Git' - SLL**



**'Country Bumpkin' - PR**





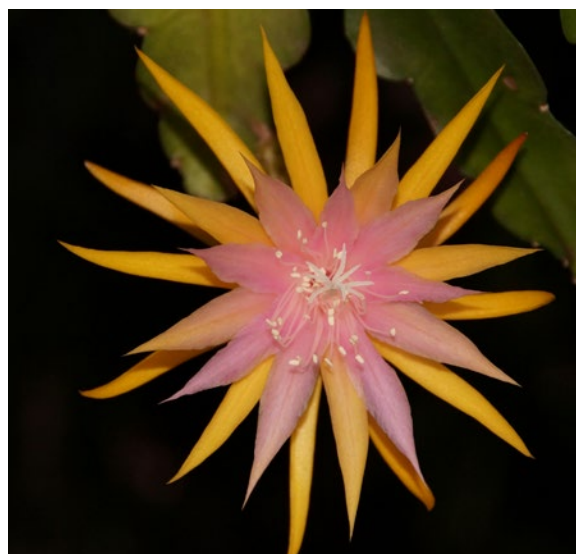
**'Dracula's Mark' - GAM**



**'Jalisco Charme' - RUD (summer)**



**'Felipe Antonio-Nones' - NONES**



**'Jalisco Charme' - RUD (winter)**



**'Gay Pride' - NONES**



**'Jalisco Charme' - RUD**





**'Kodi II' - RUD**



**'Lady Stardust' - RK**



**'Kodi II' - RUD**



**'Lady Stardust' - RK**



**'Kodi II' - RUD**



**'Lawrence Antonio-Nones' - NONES**





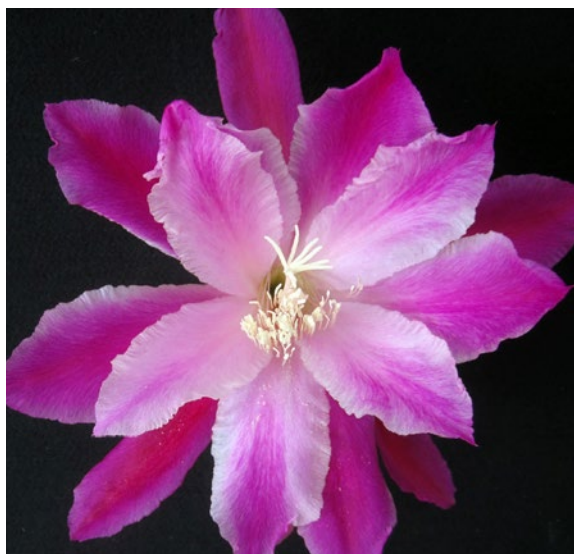
**'Lion Fish' - NONES**



**'Pronghorn' - MIY**



**'Niagara Falls' - DB**



**'Purple Rain' - PR**



**'Pink Tinsel' - SHI**



**'Queen Due' - HD**





**'Radiant Crown' - MP**



**'Rudolf's Engelchen' - RUD**



**'Robert Antonio-Nones' - NONES**



**'Rudolf's Engelchen' - RUD**



**'Rudolf's Engelchen' - RUD**



**'Saint Jude' - NONES**





**'Sassy Sandra' - DFF**



**'Sugar Bear' - GC**



**'Star of Norco' - MP**



**'Sweet Supps' - SHI**



**'Sugar Bear' - GC**



**'Thirty Dreams' - RUD**



**'Thirty Dreams' - RUD**



**'Thirty Flames' - RUD**



**'Thirty Dreams' - RUD**



**'Thirty Flames' - RUD**



**'Thirty Flames' - RUD**



**'Thirty Heartbeats' - RUD**





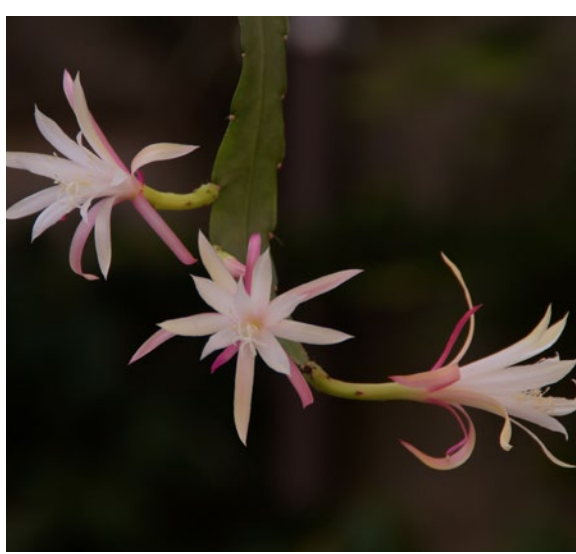
**'Thirty Heartbeats' - RUD**



**'Thirty Kisses' - RUD**



**'Thirty Kisses' - RUD**



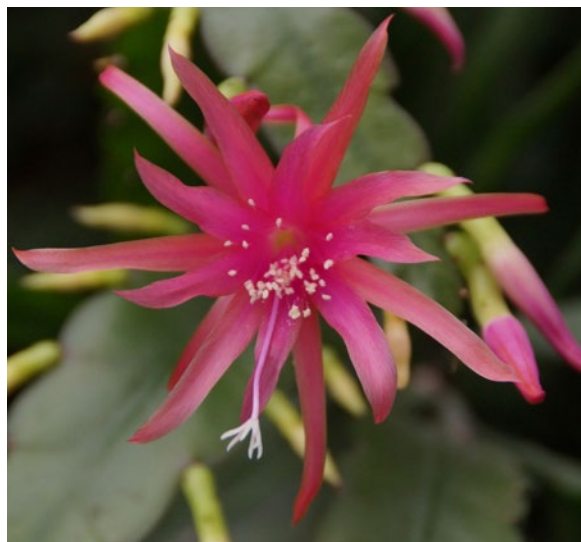
**'Thirty Snowflakes' - RUD**



**'Thirty Kisses' - RUD**



**'Thirty Snowflakes' - RUD**



**'Thirty Wishes' - RUD**



**'Thirty Wonders' - RUD**



**'Thirty Wishes' - RUD**



**'Thirty Wonders' - RUD**



**'Thirty Wishes' - RUD**



**'Thirty Wonders' - RUD**





**'Voodoo Child' - RK**



**'Yellowhead' - SHI**



**'Voodoo Child' - RK**



**'Yosemite Falls' - GB**

## Refreshments Schedule

To find when it is your turn to bring refreshments to an ESA meeting, look for your last name initial in the column to the left. The meeting date to the right is when you have the privilege of providing food and cleaning up.

LAST INITIAL ..... MEETING DATE  
He-Ku ..... Tue, May 2, 2017  
L-Mi ..... Tue, June 2, 2017

Mo-N ..... Wed, July 5, 2017  
O-Ra ..... Tue, Aug 1, 2017  
Potluck ..... Tue, Sep 5, 2017

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# Calendar of Events

## May 2017

**SBES ANNUAL SHOW & SALE** Sun, May 7

Location: South Coast Botanic Garden, Frances Young Hall

**SDS ANNUAL SHOW & SALE** Sat-Sun, May 13-14, Sat SALE ONLY

Location: Casa Del Prado, Balboa Park

**ESA ANNUAL SHOW & SALE** Sat-Sun, May 20-21, Sat SALE ONLY

Location: Arboretum of LA County, Ayres Hall

**ESA BOARD MEETING** Tue, May 30, 7:00 pm

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## June 2017

**ESA GENERAL MEETING** Tue, June 2, 7:30 pm

Program: Awards Presentation and New Registrations From 2016

Refreshments: Members with last name starting with L thru Mi, the June meeting is your turn to bring snacks and clean up.

Location: Arboretum of LA County, Bamboo Room.

**LAIFA ANNUAL FERN SHOW & SALE** Sun, June 10-11

ESA will be selling plants and cuttings at this event.

Location: Arboretum of LA County, Ayres Hall

**ESA BOARD MEETING** Tue, June 27, 7:00 pm

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## July 2017

**ESA GENERAL MEETING** Wed, July 5, 7:30 pm

Program: TBD

Refreshments: Members with last name starting with Mo thru N, the July meeting is your turn to bring snacks and clean up.

Location: Arboretum of LA County, Bamboo Room.

**ESA BOARD MEETING** Tue, July 25, 7:00 pm

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## August 2017

**ESA GENERAL MEETING** Tue, Aug 1, 7:30 pm

Program: TBD

Refreshments: Members with last name starting with O thru Ra, the July meeting is your turn to bring snacks and clean up.

Location: Arboretum of LA County, Bamboo Room.

**ESA BOARD MEETING** Tue, Aug 29, 7:00 pm

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## September 2017

**ESA GENERAL MEETING** Tue, Sep 5, 7:30 pm

Program: Annual Silent Auction & Member's Pot Luck Social

Refreshments: Everyone bring a dish.

Location: Arboretum of LA County, Ayres Hall.

**ESA BOARD MEETING** Tue, Sep 26, 7:00 pm

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