

ORCHID BASICS 101

WHEN TO WATER, FERTILIZE, REPOT AND DIVIDE YOUR ORCHIDS

Alex Nadzan, Revised September 10, 2009

Unfortunately our orchids can't talk to us, however, more often than not, one can gain insight into how happy they are by careful observation of how they are growing and their basic anatomy, leaf structure, and root characteristics and health. In addition, a basic knowledge of the type of orchid, it's parentage, and behavior of related plants can go a long way in providing them with their essential needs for optimal growth and blooms. The following observations are based on my experiences in growing outdoors in coastal San Diego using pot culture, but the basics apply to inland areas as well with minor alterations in watering frequency and protection of plants from cold.

I. WHEN TO WATER? WHEN THEY NEED IT! HOW DO YOU KNOW? CONSIDERATION OF EACH ORCHIDS WATER NEEDS AND YOUR GROWING ENVIRONMENT (TEMP, LIGHT, GROWTH MEDIUM, SEASON).

- a. Generalization: Water well when orchid is in active growth and less so when dormant.
- b. Growing outdoors, indoors, and in greenhouse environments are quite different. Consider your environment.
- c. Most orchids like moderate humidity (50%). San Diego has relatively low humidity during our growing season and higher humidity in winter, the opposite of what is ideal. Orchids grown outside need extra humidity and appropriate media for optimal growth during their active periods.
- d. It is best to water in late morning or early afternoon to allow plants to dry before nightfall. This minimizes the occurrences of bacterial and fungal diseases.
- e. An orchid's growth type, temperature and light requirements will provide guidance on how much water they need during their growth period (spring, summer and fall). Most orchids should be watered sparingly in winter.
- f. Basic anatomy and type of orchid provides info on watering needs as indicated below in the tables below.

Epiphytes – Sympodial

Sympodial (multifooted) growth (pseudobulbs, canes, multiple fans with spongy, silvery roots (velamen), grow on trees or rocks in nature - Need to be watered well, then allowed to dry out between waterings.

Alliance	Member	Night Temp. Range	Light
Cattleya	Brassavola	C-W	M-H
	Cattleya	I	M-H
	Laelia	I-W	M-H
	Ryncholaelia	I-W	M-H
	Sophronitis	C-I	L-M
	Encyclia	C-W	M-H
	Epidendrum	C-W	L-H
Oncidium	Brassia	C-I	M-H
	Miltoniopsis	C-I	L-M
	Miltonia	C-I	L-M
	Oncidium	C-I	M-H
	Odontoglossom	C	L-M
	Rodriguezia	I-W	M-H
	Tolumnia	I-W	M-H
Dendrobium		C-W	L-H

Temperature (°F): C = cool (50-55); I = intermediate (55-65); W = warm (65-70)

Light (ft-candles): L = low (500-1500); M = moderate (1500-3000); H = high (3000-4000)

Epiphytes (Monopodial)

Monopodial (one footed) growth, plants have no water storage capability, need to be kept moist (but not soggy) for Doritis/Phalaenopsis or frequently watered to maintain high humidity (most Vandas).

Alliance	Member	Temperature Range	Light
Vanda	Aerides	I-W	M-H
	Ascocentrum	C-W	M-H
	Doritis	I-W	L-M
	Neofinetia	C-W	L-M
	Phalaenopsis	I-W	L-M
	Renantheria	I-W	M-H
	Rhynchostylis	I-W	M-H
	Vanda	C-W	M-H

Terrestrial and Semi-terrestrial (Sympodial)

Grow on floor of forest or on edge of forest in open space. May or may not have pseudobulbs. Roots are hairy or fleshy, not covered with spongy velamen. Prefer humus rich media and moist conditions. Do not allow to dry out between waterings.

Alliance	Member	Temperature Range (Night)	Light
Paphiopedium		C-I	M
			M-H
Cymbidium	Standard	C	M-H
	Miniature	C-I	L-H
	Warm tolerant	I-W	M-H
Zygopetalum		C-I	M-H

II. WATERING TIPS

- a. Shriveled pseudobulbs, leaves and aerial roots indicate either over or under watering and generally suggest probable root damage.
- b. Sometimes one does not realize a problem exists until it is too late. Some orchids can appear to grow and even bloom with minimal roots, then decline very rapidly. Careful observation will help avoid the problem.
- c. Use clear plastic pots of various sizes to gauge wetness of and condition of medium as well as health of roots.
- d. Water frequently during active growing season (1-2 times per week), depending on environment.
- e. Taper off as orchids go into dormancy (late Fall into Winter). In winter, keep on dry side and water during warm spells. Exception, mounted orchids. Water more frequently but less so than in warmer seasons.
- f. When watering, water thoroughly to fully wet medium. Water entire collection, then water again (~ 30-60 min. later) to make sure medium is well-watered.
- g. If you only have a few pots, lift them to gauge wetness or use the pencil test.
- h. Maintain good air circulation and humidity (moderate 50-60%) – increase humidity, particularly during dry spells and Santa Ana's.

III. WHEN TO FERTILIZE? WHEN THEY NEED IT! THEY NEED IT DURING ACTIVE GROWTH PERIODS.

- a. Fertilize orchids during active growth periods and taper off or eliminate during dormant periods.

- b. During growing season, feed WEAKLY, WEEKLY using $\frac{1}{4}$ to $\frac{1}{2}$ recommended strength of a balanced orchid fertilizer (20-20-20). Increase amount and frequency during high growth periods. As orchids become dormant towards fall and in winter, water infrequently and on warm days.
- c. Use a water soluble, multipurpose (20-20-20 or 15-15-15) fertilizer if you use tap water. If you use distilled, demineralized or RO water, then use fertilizers designed for those sources (ex. MSU RO fertilizer). Avoid fertilizers containing urea as a nitrogen source, rather use ones that have ammoniacal and nitrate as the sources of nitrogen. See fertilizer label for composition.
- d. During the growing season fertilize three weeks in a row, then for the fourth watering, do a thorough flushing with water to leach out excess salts.
- e. Some hobbyists prefer to pre-wet the medium prior to applying fertilizer solution.

IV. WHEN TO REPOT YOUR ORCHID? DURING ACTIVE PERIODS OF NEW ROOT GROWTH!

- a. Best time to repot nearly all orchids is during periods of active root growth (roots with green or reddish tips), just as the roots are emerging. Usually occurs when plants are initiating new growth of pseudobulbs or after blooming, but not always. Some members of cattleya alliance produce new pseudobulbs prior to sending out new roots, so only repot them when new roots begin to appear. Paphiopediums are an exception. They can be repotted almost anytime and benefit from fresh medium.
- b. Reasons to repot
 - i. Orchid has outgrown pot
 - ii. Medium has broken down
 - iii. Want to change medium to suit your growing conditions. New plants, particularly from Hawaiian growers, can be a problem as well as some plants grown in sphagnum peat moss (phals).
 - iv. Plants are not growing well in existing medium
 - v. Desire to multiply (divide) plant (see section VII below)

V. REPOTTING TIPS

- a. Use gloves and clean tools (sterilize all tools or use sterile, disposable razor blades, potting sticks, clean surfaces, etc) to avoid transmission of viruses from plant to plant.
- b. Remove plant from pot and discard old media and dead roots. Try not to disturb viable roots with attached media, which are usually on lead pseudobulbs of plant produced during the previous growing season.
- c. Use the repotting opportunity to clean up plant by removing dead leaves, old pseudobulbs, and spent sheaths or spikes. Check for disease and remove any scale (soap or alcohol and old toothbrush) from bulbs,

rhizomes and leaves. Scale tends to hide under old protective sheaths of the pseudobulbs and flower sheaths, so be sure to examine plant carefully and remove any visible scale.

- d. Add styrofoam peanuts (not biodegradable ones) to bottom inch of pot to aid air circulation and drainage.
- e. Do not overpot, since most orchids like to be root bound. Use smallest pot to accommodate roots and allow up to 2 years growth. Place back of plant (old growths) at back edge of pot to allow for growth from newer leads in the front of the rhizome. For orchids that are grow in multiple directions, position plant in center of pot.
- f. If plant is not vigorous and roots are not very healthy, place in smallest pot possible to encourage new root growth.
- g. Avoid damaging new roots and new growths during potting process.
- h. Type and size of media should be proportional to size of pot and root type. For smaller pots use finer medium and for larger pots use more coarse medium. Also fine roots prefer fine medium, while coarse roots do well in larger medium). Terrestrial and semi-terrestrials need a moisture retentive media.
- i. Repotting media – use good quality bark (Kiwi bark) and medium to coarse perlite (a ratio of 3:1) – works well for cattleya, oncidium and dendrobium alliances. Some use charcoal or other inert material to open up mix and improve drainage. Size of bark gauged to size of pot, thickness of roots. Paphs use fine or mixed fine/coarse bark and perlite. Cymbidiums do well in coconut husk chips (pre-soaked three times to leach out salts) or in bark/perlite mix (3:1).

VI. STARTING BARE ROOT DIVISIONS AND RESCUING PLANTS

- a. For starting plants from bare root divisions, try the following for cattleyas, oncidiums, dendrobiums, and related sympodial orchids. Place bare root plant in plastic bag with a small amount of moist sphagnum peat moss to maintain high humidity and stimulate new root growth. Place sealed bag in a warm place with bright indirect light. Once roots begin to form, pot up into favorite medium or the charcoal-based medium described below and keep humid side until established.
- b. To rescue Paphs, Phals and related orchids that have lost all or most of their roots, the above bag trick does not work. Use of semi-hydroponic conditions has been reported to work for both types (See article by Anne and Rainer Hartmann, Initiating Paphiopedilum Root Growth, Orchid Digest, Vol. 72, No. 3, July, Aug, Sept, 2008, which may work for Phals as well. For a link to standard semihydroponic techniques that do work for stimulating roots on phalaenopsis, see <http://www.firstrays.com/hydro.htm>.
- c. For rescuing stressed plants or plants that have lost most or all of their roots in the cattleya, oncidium and dendrobium alliances, try the following medium: coarse charcoal, coarse perlite and Canadian peat moss (not

sphagnum peat moss) in a ratio of 4:4:1. Use clay pots (azalea type or slotted orchid pots appropriate for the size of plant) or use small clay or plastic pots (2-3 inch) for small sized plants. Mix and wet medium well, place 1-3 inches of styrofoam peanuts in pot (bottom third of pot), place plant in pot, then firm the medium around the rhizome, but do not pack it in too tightly. Secure plant with rhizome clip or stake, then water well. If plant has some new roots or at least new growths, these conditions usually stimulate vigorous root growth and rescue of plants in about 75% of the cases, particularly when potted up during the main growing season (May-July). Sometimes even stubborn, dormant plants are stimulated to grow under these conditions.

- d. From my experience, species of the cattleya alliance do quite well in the charcoal-based medium, as do most hybrids, particularly those that normally like to grow on the dry side or mounted (*Brassovola nodosa*, *Brassavola Little Stars*, *Cattleya walkeriana*, *Encyclias*, etc.). I've also had success with stressed oncidiums and dendrobiums.
- e. Also, plants that ramble and readily grow out of their pots in bark, do not tend to do so as readily in the charcoal-based mix.
- f. A friend of mine located in Orange County, regularly grows all of his cattleya alliance orchids in the charcoal mix using clay pots. This includes seedlings (finer charcoal and perlite and upping the level of Canadian peat). **Caution:** orchids grown in this media must be kept fairly dry in winter to avoid root damage.
- g. The above charcoal medium and technique works probably because it stimulates root growth by providing high humidity for the orchid shortly after repotting. As the orchid medium is watered over time, the peat moss leaches out and the plant is left in primarily charcoal and perlite, which do not decompose and provide a "clean" environment for the roots.
- h. I have kept plants in this medium for two years without any apparent problems, but would recommend repotting after that period to a larger pot to accommodate new growth and freshen the medium.

VII. WHEN TO DIVIDE YOUR ORCHIDS? DURING ACTIVE PERIODS OF NEW ROOT GROWTH!

- a. The best time to divide your orchids is the same as when to repot, when the plants just begin to initiate new root growth.
- b. When selecting a division, try to include at least three or, preferentially, four established pseudobulbs in addition to any new bulb growth.
- c. Use a sterile cutting tool or new razor blade to make the cut or cuts.
- d. Clean and groom the division to remove any dead roots or disease, then pot up in the smallest pot the root ball will fit into and secure the plant with a plant clip or stake.
- e. If the plant is very valuable and you want to maximize the number of divisions, consider separating and planting the back bulbs in the above charcoal mix (VIc) as it tends to encourage new leads to develop from the

old bulbs, even if the old bulbs do not have leaves. This has worked for some *Laelia anceps* and dendrobiums.

- f. Generally the bark or charcoal mix described in sections Vi or VIc will work, but the charcoal mix does promote new root growth and has worked particularly well for cattleyas, shomburkias and dendrobiums. Most divisions that were reluctant to sprout new roots in bark mix, when planted into the charcoal-based medium, generated new root growth.

VIII. PESTS AND AILMENTS

- a. Slugs, snails, rodents – use appropriate baits and traps
- b. Bacterial and fungal diseases – water earlier in the day to allow plants to dry before nightfall. Try to keep plants on dry side in winter to minimize disease and protect from cold spells.
- c. Viruses – use appropriate potting techniques to avoid transfer of viruses (sterile potting tools, gloves, etc).
- d. Scale can be a major problem for cattleyas and cymbidiums and it can be devastating to the health of a plant.
 - i. Light infestations – use soap solution or rubbing alcohol spray (old toothbrush) on bulbs, rhizomes and leaves, followed by a systemic insecticide.
 - ii. An effective and relatively safe systemic insecticide for scale and many other pests is Bayer Rose and Flower Insect Killer, containing Merit (imidacloprid) and Tempo ultra insecticide (β -cyfluthrin) as the active ingredients. It can be obtained in 24 oz spray bottles if you only require small amounts (Home Depot, Lowes, Walmart). The same insecticide is available in greater quantities as a ready to spray concentrate (hose end spray bottle, 32 oz, use the high setting), or just as the concentrate under the name Bayer Advanced Complete Insect Killer (40 oz). **IMPORTANT:** For effective scale control, it is essential to treat your plants with the insecticide every 7-10 days using three successive applications, particularly if the infestation is severe.

IX. RESOURCES

Texts for beginners and advanced hobbyists (paperbacks):

Miracle-Gro's Complete Guide to Orchids, Ned Nash, Steve Frowine, Meredith Books, 2008.

Orchids for Dummies, Steven A. Frowine, Wiley Publishing, 2005.

Supplies (the most economical sources I have found):

Kiwi orchid bark and coarse perlite (no. 3) – Fred Clarke, Sunset Valley Orchids, Vista, CA <http://www.sunsetvalleyorchids.com/>

Coarse charcoal (50 lb. bags) – Western Farm Service (now Crop Protection Services), San Marcos, CA (<http://www.westernfarmservice.com/index.html>)

Coarse perlite (no. 3 and 4) and charcoal – US Orchid Supplies, Oxnard, CA (<http://www.usorchidsupplies.com/>)

Clear plastic pots and misc. orchid supplies - Calavo Gardens, La Mesa, CA, Ben Machido, Ph&Fax: 619.660.9810; Cell: 619.948.5942; email: bnmach16814@aol.com

Plastic and latex gloves – Smart and Final

Single edge razor blades (100 packs, paint department), clay azalea pots (3 and 6 inch slotted orchid or plain) and small amounts of orchid bark – Home Depot or Lowes

Plain clay azalea pots (4 inch) – Walter Anderson's Nursery