



St. Augustine Orchid Society

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Growing Cattleyas - What Can Go Wrong

Part 1 – Cultural Missteps

by Sue Bottom, sbottom15@hotmail.com

Cattleyas are hard to resist, having showy and fragrant flowers that come in various shapes, sizes and colors. They require lots of bright light to manufacture the reserves necessary to produce those incredible blooms that last anywhere from one week to two months. They enjoy an open, freely draining potting mix that allows plenty of air around the roots. They store water and energy in their pseudobulbs so they are accepting of droughty conditions for short periods. Most are moderately cold tolerant but require winter protection from the coldest temperatures. Like so many orchids, they enjoy summering outdoors under a shade tree or in a screened area exposed to loads of fresh air. All that bright light and the day night temperature change pay big dividends when it comes time for them to bloom.

So if they are so easy to grow and bloom, what can go wrong? You tend to blame problems you may encounter on orchid pests and diseases, but oftentimes the culprit is some cultural misstep that either created the problem or created the environment that allowed a pathogen to thrive. Improper watering can create a variety of problems as can insufficient air movement, extreme temperatures, and other cultural mistakes. Cultural errors may very well cause more problems than those from orchid pests and diseases.



1. The aerial parts of the plant are shriveled and wrinkled, dehydrated because the damaged roots are unable to absorb water. Additional watering will not help until the root system recovers.



2. Watering late in the day when the night turns cool or the skies turn gray can cause edema, blisters that may be unattractive but are not too harmful.

Improper Watering. Overwatering is often cited as the primary cause of death of orchids in hobbyists' care. Orchids do not die from overwatering per se, but they may suffer if overwatering results in insufficient air around the roots. If your plant begins to look dehydrated, the leaves look leathery rather than turgid, or the pseudobulbs are wrinkled rather than fat and plump, it is time to knock it out of the pot and look at the roots. Either



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you are under-watering, in which case the roots look dry but viable, or you are watering too frequently so the mix is staying too wet, eventually decaying and compacting around the roots smothering them.

Another common watering error is watering too late in the day when the nights turn cool or the weather turns grey, causing edema. The plant absorbs more water than can be shed from the leaves, so the leaf cells swell and produce a blister-like lesion. During the cooler months, it is particularly important to follow the much repeated advice to water early in the day and do not water on a gray or rainy day.



3. The cataphyll or leafy sheath around the pseudobulb often forms a pocket in which water from watering, rain or condensation can accumulate.



4. Peel back the leafy tissue so any accumulated water will drain freely, otherwise the pseudobulb can rot and you may have to remove diseased tissue.



5. Allowing trapped water to stand in the tender new growths can result in rotten tissue. This is a cultural error rather than disease issue.

Water Pocketing. A leaf-like bract forms around the growing pseudobulb that surrounds and protects the new growth, called a cataphyll (or the descriptive term sarong). Sometimes a pocket forms between the pseudobulb and the cataphyll and water from rain, watering or condensation can accumulate. Omnipresent bacteria can grow in this wet pocket and rot the new growth. This is a cultural issue rather than a disease problem. Outside growers need to be particularly vigilant. When you notice these pockets, gently peel the sheaths down so water can drain from them but be careful because the new tissue is very easy to bruise and break. You can also add a few drops of hydrogen peroxide to kill any bacteria.

Problems with Buds. As long as the sheath remains green or a healthy colored tan, it will continue to protect the newly forming bud from damage. If it turns a sickly colored yellow or black, you should consider gently peeling down the sheath to expose the bud to air. Sometimes the day-night temperature change can cause water condensation inside the sheath and this water can result in the bud rotting.



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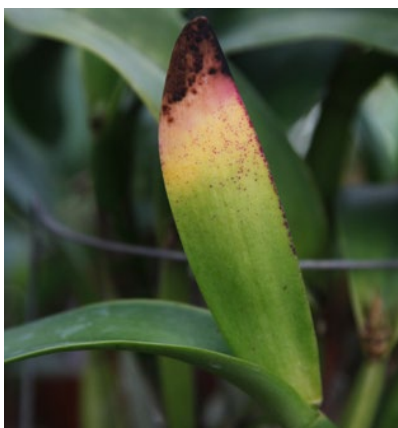
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You should be aware that some cattleyas bloom from green sheaths, so they bloom shortly after the sheath has formed. Others bloom from dried sheaths, so the bud primordium rests for several months in the sheath before transforming into flower buds. Sometimes a sheath will form but buds fail to develop, called a blind sheath. This happens most commonly on an immature plant without sufficient reserves to fuel the development of the flowers.



6. If the sheath is a healthy green or tan, it will protect the buds. Sometimes the plant rests after forming the sheath so the sheath dries and the flowers do not emerge until several months later.



7. If the sheath color starts to turn a sickly yellow to brown shade or starts to look “wet”, you should think about gently peeling it back to expose the emerging bud to air.



8. Day night temperature changes can cause condensation inside the sheath, and this can easily rot the developing flower buds.

Salt Accumulation. It is so important to understand your water quality. If you see white hard water stains on your leaves, you likely have a high alkalinity water with a high dissolved solids content. The salts in the water tend to accumulate in the root zone as the potting media dries, and the salts become more and more concentrated with each wet/dry cycle. If those salts reach a concentration toxic to the roots, the root tips will burn. Most cattleyas are not as salt sensitive as some other orchids, but if salts are accumulating in your pots you may see black tips at the end of your leaves as the plant tries to shed excess salts. Sometimes this is mistaken for the fungal infection Anthracnose, the difference being that with Anthracnose, you see little brown dots (the fungal fruiting bodies) at the interface between the dead and live tissue. The higher the salt content, the more important it is to have a long irrigation cycle or to flush the pots regularly. To flush, water thoroughly to solubilize the salts and then come back and water thoroughly a second or third time to force the salts out of the pot. If you are lucky enough to have a relatively pure water or your orchids receive a lot of rainwater, nutrient deficiencies rather than salt accumulation may become an issue.

Nutrient Deficiencies. Cattleyas are not heavy feeders doing well with dilute fertilizer applications providing around 50 ppm nitrogen. If you use a good quality fertilizer with at least half of the nitrogen in the nitrate form and micronutrients, the only likely mineral deficiencies are calcium and magnesium. These two elements are not present in many fertilizers so if your water does not contain them in sufficient amounts, you will have to



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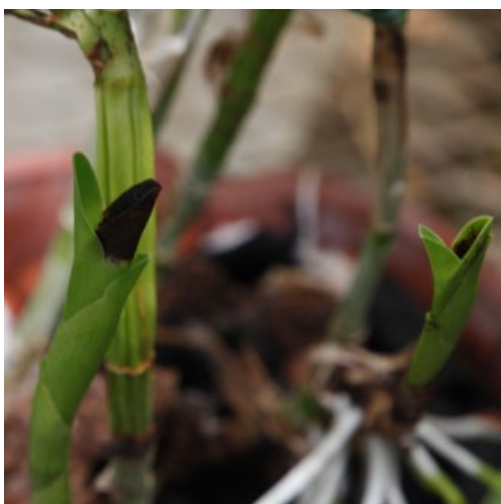
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supply them. This is of particular concern for those with a mostly pure water source, like rainwater

If you notice black tips on your cattleyas during the growing season, you should consider whether your plants are receiving enough calcium. Calcium is essential for building new tissue and it cannot be moved in the plant from older to younger leaves. Without enough calcium, the newly expanding tissue will not develop properly so it is less capable of withstanding attack by rots. Supplying calcium after you notice the new growths turning black will not help, you must cut away the damaged tissue and promise to supply additional calcium earlier in the season next year. High alkalinity water often contains plenty of calcium, and an acid generating fertilizer like a 20-10-20 helps make the calcium more available. Pure water like rainwater has no calcium so it must be supplied, such as by using a Cal Mag fertilizer or calcium nitrate. Many other calcium supplements are available from nursery supply and hydroponic stores.

If you get an inordinate amount of leaf yellowing when the growth season begins in spring or notice chlorotic leaf mottling on leaves after exposure to extremes of temperature, magnesium deficiency may be the culprit. Magnesium, a major component of chlorophyll, can be moved within the plant from the older to younger leaves. If your plant requires more magnesium than you are supplying it when the growth cycle begins, your plant will sacrifice the older leaves to produce new growths. In leaves that formed with insufficient magnesium, the chlorophyll can be damaged after exposure to too hot or too cold conditions resulting in leaf mottling. If your water does not contain enough magnesium, use a Cal Mag fertilizer, Epsom salts or some other magnesium supplement.



9. Calcium deficiency manifests itself in blackened tissue in the newest growths



10. Magnesium deficiency can cause older growths to yellow and leaves may appear mottled after exposure to high temperatures.

Repotting Errors. Roots are the key to your plant's overall health. Anytime you repot an orchid and disrupt the root system, your plant will undergo some degree of transplant shock. You can minimize this by vigilantly observing your plants and repotting just as new



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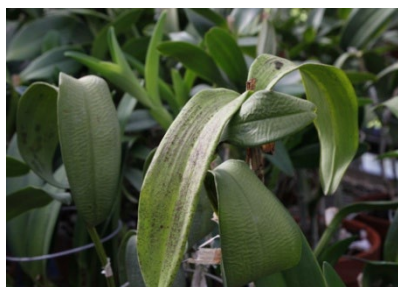
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roots are beginning to form so the new roots grow into fresh mix and establish quickly. The unifoliate are generally much more forgiving of the repotting process than are the bifoliate, though both will weather the transplant shock much more easily if repotted just before the new roots emerge. Some varieties grow new roots with the new leads in the spring while others form roots after the new lead has bloomed, as so succinctly described by Bill Rogerson in his must read article “Cattleya Species and Their Culture” published in the *Orchid Digest* in 2004 and republished in the October 2016 Cattleya Supplement in *Orchids*. His observations are detailed in Table 1. If you repot your “roots after flowering” cattleyas too early, before the new roots are ready to emerge, the plant may become severely dehydrated because the older roots have been damaged and cannot uptake water efficiently, and the new roots are weeks to months away from forming.

If you wait too long to repot your cattleya such that the potting mix degrades, the mix tends to compact around the roots, excluding air and thereby suffocating the roots, so the plant likewise suffers from dehydration. You occasionally find a white filamentous snow mold growing in the decaying mix. The snow mold is water repellent, so once it covers the roots they cannot absorb water. If your plant starts to look dehydrated, examine the roots and determine how best to proceed.



11. Repot cattleyas right before new roots form, particularly bifoliate, or they may sulk and suffer dehydration.



12. If you repot at the wrong time or allow your potting mix to degrade, the roots will not be able to supply the plant with enough moisture and it will dehydrate.



13. Snow mold grows in decaying potting mix and can suffocate the roots. Wash off the old potting mix and repot in fresh mix.

Too Much or Too Little Light. Cattleyas are bright light lovers, requiring lots of energy to produce their showy flowers. Many growers recommend growing them in intense light just short of burning the leaves. The leaves turn as hard as cardboard after they mature in plants grown in very high light. Leaf color is often used as an indicator of light intensity. If the leaves are yellowish; the light may be too bright, if the leaves are a lush green, the light is probably too low, and if grown in just the right light, the leaves are a granny apple green. If your otherwise healthy cattleya doesn't bloom for you, move it slowly into more light. For many orchids, insufficient light is the major reason they fail to bloom for you.



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14. Give your plant enough of the right kind of light so it will bloom well like the plant on the left, the plant on the right is a pretty green, but bloomless.

photo courtesy of Greg Allikas



15. Plants grown too bright are yellowish in color. They are often stressed from the heat, particularly if the water and nutrients supplied are not in balance with the light.



16. Sunburn is really a thermal effect that begins as a whitish or yellowish scar fading to tan or black depending on the severity of the burn.

The sudden appearance of leaf spots can be caused by sunburn, a result of leaves becoming overheated from too intense light. Many orchid growers have sunburned their plants as the sun angle changes with the seasons or after moving plants outdoors in the spring. The burn occurs on the highest point of the leaf where it is exposed to the most direct sun rays. The burn fades to a thin tan colored leaf scar over time and can be invaded by secondary infections. If the damage is not too severe, it is unsightly but the leaf will still photosynthesize. You may decide to remove severely damaged leaves.

Heat and Cold Damage. Extremes of temperature, either too hot or too cold, can damage your plants. Heat stress starts to occur at temperatures above 95°F or so. If leaf temperatures continue to rise, heat damage, resembling sunburn, can occur, with the visible signs of damage first occurring at temperatures around 110°F and death of the tissue at 130°F. Air movement and adequate moisture along with additional shading can help control leaf temperatures. Cold damage can occur from exposure to low temperatures, causing the collapse of cell tissue resulting in surface lesions, pitting, sunken areas and discoloration. The tissue may look water soaked, wilted and browned and be susceptible to secondary infection. Most cattleya alliance plants prefer temperatures above 55°F though many will tolerate temperatures into the mid 40's. Cattleyas from the Amazon like *C. violacea* prefer warmer temperatures. There are many cold hardy varieties that tolerate temperatures in the mid to upper 30's, like *C. (syn. Soph.) coccinea*, *C. loddigesii*, *C. intermedia*, *L. anceps* and *L. purpurata*.

You can commit sins of commission as well as sins of omission with your orchids. Some cultural errors are the result of something you did, like overwatering or repotting bifoliate before new roots are forming. Other cultural errors are a result of things you did not do, like not repotting the cattleya before the mix degraded or not peeling back that sheath so water pockets and rots the new tissue. The majority of potential problems can be avoided by providing enough of the right kind of light, watering and fertilizing properly and repotting before the mix sours and becomes salt encrusted. If you observe your plants each time you water, you will learn to recognize the signs of happiness as well as the signs of distress.



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17. Lc. Allen Condo 'Joe's Beauty'

When all goes well, your cattleyas reward you with beautiful blooms that make all your efforts worthwhile.

Guide to Repotting Cattleyas – Rooting and Flowering Habits of Cattleya Species					
Cattleya Species	Judging Class	Roots before Blooming	Roots after Blooming	Unusual Growth Patterns	Blooming Season
<i>C. aelandiae</i>	Bifoliate			x	April / May and through Summer
<i>C. amethystoglossa</i>	Bifoliate	x			January / February
<i>C. araguaiensis</i>	Unifoliate				July



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<i>C. auranticea</i>	Bifoliate	x			February / March
<i>C. aurea</i>	Unifoliate		x		July / August / September
<i>C. bicolor</i>	Bifoliate		x		August / September
<i>C. bowringiana</i>	Bifoliate	x			October / November
<i>C. deckeri</i>	Bifoliate	x			December / January
<i>C. dowiana</i>	Unifoliate		x		late June / July
<i>C. eldorado</i>	Unifoliate		x		September
<i>C. elongata</i>	Bifoliate		x		September
<i>C. forbesii</i>	Bifoliate		x		April / May
<i>C. gaskelliana</i>	Unifoliate		x		July
<i>C. granulosa</i>	Bifoliate		x		May / Early June
<i>C. guttata</i>	Bifoliate		x		September
<i>C. harrisoniana</i>	Bifoliate		x		June / July
<i>C. intermedia</i>	Bifoliate	x			March / April / May
<i>C. iricolor</i>	Unifoliate	x			April / May
<i>C. jenmanii</i>	Unifoliate	x			December / January
<i>C. kerrii</i>	Bifoliate				April / May
<i>C. labiata</i>	Unifoliate	x			October / November
<i>C. lawrenceana</i>	Unifoliate	x			March / April
<i>C. leopoldii</i>	Bifoliate		x		June / July
<i>C. loddigesii</i>	Bifoliate	x			November to March
<i>C. lueddemanniana</i>	Unifoliate		x		March / April
<i>C. luteola</i>	Unifoliate	x			April / May
<i>C. maxima</i>	Unifoliate	x			July to November
<i>C. mendelii</i>	Unifoliate	x			April / May / June
<i>C. mooreana</i>	Unifoliate	x			November
<i>C. mossiae</i>	Unifoliate	x			April / May
<i>C. nobilior</i>	Bifoliate			x	March / April
<i>C. perciavaliana</i>	Unifoliate	x			December / January
<i>C. porphyroglossa</i>	Bifoliate		x		May / Early June



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<i>C. quadricolor</i>	Unifoliate	x			Late December / January
<i>C. rex</i>	Unifoliate		x		July
<i>C. schilleriana</i>	Bifoliate		x		April / May
<i>C. schofieldiana</i>	Bifoliate		x		July / August
<i>C. schroderae</i>	Unifoliate	x			March / April
<i>C. skinneri</i>	Bifoliate	x			April
<i>C. tenuis</i>	Bifoliate		x		September
<i>C. trianaei</i>	Unifoliate	x			January / February
<i>C. velutina</i>	Bifoliate		x		August
<i>C. violacea</i>	Bifoliate			x	May through Summer
<i>C. walkeriana</i>	Bifoliate			x	December to April
<i>C. warneri</i>	Unifoliate		x		May
<i>C. warscewiczii</i>	Unifoliate		x		June / July
<p>Note: For 'Roots Before Blooming' Cattleyas, roots emerge as a new lead grows and blooming occurs after the new lead and roots are mature; repot when they begin to send up new growths in spring and summer.</p> <p>For 'Roots After Blooming' Cattleyas, the new lead grows, matures and flowers and only then do new roots emerge, repot immediately after they bloom in spring, summer and fall. In some cases, the roots emerge as the lead develops or the blooms open, repot after the new roots start to emerge even if this disrupts the bloom cycle.</p> <p>For 'Unusual Growth Patterns' Cattleyas, repot as the new leads are developing in the spring. <i>C. aclandiae</i> and <i>C. violacea</i> send up new growths in the spring and when mature, immediately flower and then start a second growth, with roots forming anytime during this growth cycle. <i>C. walkeriana</i> and <i>C. nobilior</i> send out leafless growths in winter that bloom when the leads mature (roots may or may not emerge from these blooming growths) and then sends up regular leaved growths that do not bloom but roots emerge as they grow. Repot these after blooming when the new leaved growths grow in the spring.</p>					
<p>Source: Rogerson, William P., <i>Cattleya Species and Their Culture</i>. <i>Orchid Digest</i>. 68:4. pp. 196-219 and the October 2016 Supplement to <i>Orchids</i>. 2016. 85(10 Supplement). pp 26-37.</p>					

Citations and Additional Reading:

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