Desert Rose (Desert Rose) Culture

Desert roses (Adenium) by nature grow in the semi-arid Sub-Sahara region and the Arabian Peninsula. In nature Desert Rose receive full tropical sun all day long and only infrequent rains. In nature the desert rose loses its leaves and goes "dry" dormant when it doesn't receive rain for a few weeks. This is the reason Desert Roses grow very slowly in their native environment, they are frequently "dry" dormant. In nature desert roses grow in gravel and cracks in rocks and need absolutely perfect drainage as they are used to having lots of air around their roots. The key for rapid growth of Desert Roses in cultivation is to provide both abundant air and abundant moisture consistently and constantly to their roots during their growing season. This is the tricky part in South Florida, especially over the long haul of many years and many rainy seasons. Desert Rose does best in a growing media in which all the media particles are permanently greater than 1/8 inch in diameter.

The photo above shows desert roses in their semi-arid native environment. The word "semi-arid" is important. Desert Roses don't thrive on dryness, they actually thrive on lots of water. But they must have a very free draining, gritty, airy and uncompressible soil mix. The desert roses shown above are growing in cracks in the caliche limestone rock, a very uncompressible, free draining, airy and alkaline environment almost completely devoid of what we would call soil and where there is virtually no organic matter. This Desert Rose is totally dependent on its fat stem (caudex) to hold water in between the infrequent rains and misty fog in this region (Socotra, a desert island off the Coast of Yemen on the Arabian Peninsula). Note that the desert roses above are in bloom but are "dry" dormant, they have no leaves. So these Desert Roses haven't received rain for a while.

Climate for Desert Rose

Anywhere where the temperature drops below freezing Desert Roses must be grown in containers and must be moved under cover to slightly warmer areas. Desert Roses cannot be grown in the ground unless there is some substantial system in place to protect them from the low temperatures.

Light and Water for Adenium

Adeniums are normally thought of as slow growing plants. However, with adequate drainage, lots of fertilizer, water, root aeration and plenty of Florida sun the new hybrids can grow surprisingly fast. Leave Adeniums in their containers in full Florida sun. These are plants which in nature grow in full equatorial sun. They need full sun all day long. Lighting of less than 100% full Florida sun results in leggy growth and a lack of flowers. The Adenium will grow very rapidly in full sun with lots of water and fertilizations in well aerated media. Don't allow Adeniums in the growing season to go without water too long. Adeniums are semi-arid region plants. Adeniums will drop their leaves and go "dry" dormant even in the middle of the summer if they go dry for too long. Cat litter in their media help Adeniums stay moist yet well aerated during the Florida rainy season.

The claim has been made that the breeding of Adeniums has produced a plant which requires less soil aeration and which accepts large amounts of organic matter in its growing media. This simply isn't true. Breeders breed for flowers and large caudexes. They all use well draining, well aerated medium. As a matter of fact, unless the breeding program is specifically designed for breeding disease resistant plants, breeding generally results in plants with less tolerance for such things as poor root aeration and fungi. That trend can be seen in lilies, roses and hibiscus, to name just a few extensively bred plants.

Pot Size for Adenium

Some sources claim that a large Adenium requires a large pot. This is a true statement. Research at a University has shown growth and flowering to be directly related to pot size, the more volume in the pot the larger and faster the plant grows and the more it blooms. Research has shown that an Adenium planted in an 8 inch pot will grow at close to double the rate of a Adenium in a 6 inch pot and will have double the amount of flowers. So Adeniums don't bloom better when pot bound.

The Planter for Adeniums

In Florida in the rainy months Adeniums placed outdoors in full sun must drain fast and need lots of air around their roots, much like epiphytic orchids. The water should drain from the top of the planting media in SECONDS and the air content of the media should be at least 15% even during the heaviest rains. In order to get this high aeration and drainage it is necessary to modify most pots. Take a decorative plastic pot and snap off the bottom tray. Then take an electric soldering iron and add dozens of hole all around the lower inch of the circumference of the pot and all around under the pot. Add the same holes to the tray, just randomize them so that the media can't get out of the pot. Then put the tray back into the holes in the pot and melt the bosses back over with the soldering iron so the tray can't drop off. To complete the drainage always add lots of holes around the lower circumference which penetrate both the saucer and the pot.

If you use a clay pot and perch it on a soil base there can be a problem. The single hole at the bottom of a clay pot can become plugged as the pot settles into the soil. Clay pots for Desert Roses need to be on platforms or seated on a bed of large gravel designed so that the bottom hole is open to the air. Another trick is to take a small plastic pot and fill it full of holes with an electric soldering iron. Position this small well holed plastic pot inside the larger clay pot over the center hole in the clay pot and fill in around the small plastic pot with pea gravel. This insures good air flow and drainage through the single hole in the clay pot as long as the hole is elevated and isn't filled with soil. Also do not use any saucer with a desert rose in a clay pot as the saucer will prevent good aeration. Don't under any circumstance plant an Desert Rose in a metal or ceramic pot without holes in the bottom. That is certain death for the plant.

Planting Media for Desert Rose in Planters which are Outside in South Florida

Most Desert Roses sold in stores are grown in coir or coco fiber, the ground up outer shell of the coconut. It drains fast, is well aerated and can be fertilized and watered frequently for a year or two before it starts to decompose and turn into an overly wet compacted mess. Coir can last years in a greenhouse where watering is controlled to once every few weeks but it doesn't last long in the Florida wet season. In the Florida wet season ANY organic material slowly decomposes and packs tighter and tighter around the roots of the desert rose. This packing will slowly but surely cut off the supply of air to the roots of the Desert Rose and this can be fatal. Repotting is a shock to the Desert Rose and it takes it up to a year to recover from the shock. So repotting frequently is not desirable for the plant.

If you want to maintain a steady, rapid and unchecked growth of a desert rose and you don't want to repot frequently because of packed down organic matter then:

- Don't leave the Desert Rose in the coir any longer than necessary. When planting the Desert Rose in your container of choice remove ALL the coir from the roots. Wash it off with a spray of water.
- Don't use cactus and palm mix from the store, it has way too much organic matter in it.
- Don't use any commercial soil mix, again, way too much organic matter.
- Don't use any organic matter: peat moss, compost, wood chips, bark, etc. During the Florida rainy season, if fertilized, this organic matter will decompose, form a sodden mess, and eventually kill the desert rose. Even pine bark will ultimately decompose into mush over several years, especially if some termites find it. And the organic matter is compressible, meaning the desert rose will form most of its fat caudex under the soil line, not desirable for most people.
- I don't use perlite or vermiculite; the perlite doesn't absorb any water or nutrients and the vermiculite decomposes and packs down over time. Perlite also has the nasty habit of floating over the rim of the planter and messing up the lawn or concrete with its white particles.

There are several alternatives for desert rose planting media. All of these alternatives have one disadvantage, they are heavy, especially when wet. But these materials don't decompose and remain airy and free draining for the life of the plant. Potting mixes for desert roses need to be judged on five things, in order of importance:

1. permanence; the ability to not decompose and compress over time
2. the ability to remain open and free draining as to allow air to get to the roots of the desert rose, i.e. the ability to drain, remain porous and not become waterlogged. This is assured if the particle or chunk size of <u>all</u> media ingredients is between 1/8 and ½ inch in diameter.
3. the ability to store water for use by the desert rose (without excluding air)
4. the ability to store plant nutrients (the so called "Cation Exchange Capacity" or "CEC")
5. the ability to supply needed Calcium and Magnesium to plants

I know of three alternatives which have at least some of these properties:

1. Surprisingly our own alkaline native soils, both sand and shell (not muck) make reasonable soils for Desert Rose, they drain reasonably fast and they don't decompose. Pure play sand can also be used. I would recommend one part $1 clay cat litter for each four parts sandy soil or sand in order to supply needed water storage. These media can hold too much water and result in Desert Rose rot. The desert roses will need frequent fertilization as sand holds few nutrients in itself for any length of time (i.e. sand has no cation exchange capacity and no ability to supply Calcium and Magnesium). There is a huge six foot by eight foot thirty five year old Desert Rose growing in a raised bed of sandy native soil close to the Gulf in Fort Myers

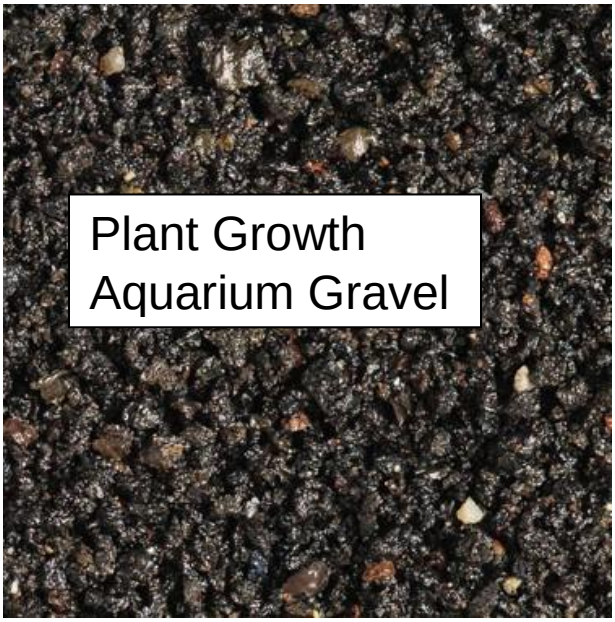
where it never gets frost. Unfortunately we get frosts in LaBelle so we can't plant Adeniums directly in the open ground.

2. A mix of one forty pound bag of pea gravel with four 7 pound bags of very cheap unscented non-clumping clay cat litter is excellent. The large irregular cat litter fused clay particles are very well aerated, drain water very rapidly, can't be compressed and don't support the growth of fungus. The particles of fused clay have many channels in them which hold both nutrients and water. They have a high cation exchange (CEC) capacity. Adenium are semi-arid plants, which means they go "dry" dormant and lose their leaves if allowed to go completely dry. This dry dormancy checks the growth of the Adenium and is undesirable. The water holding capacity of the calcined clay particles prevents them from going completely dry. This is a cheap and easy media for Adeniums.

   Note that it is important to use only the extremely cheap, unscented, non-clumping $1 per seven pounds cat litter, the more expensive scented "clumping" litter is worse than nothing at all. Note also that one should never use dirty cat litter. The cat's leavings will kill a Adenium outright. Note also that if weight is a concern (for instance it is a really large Adenium being repotted into a large container) the pea gravel can be replaced with two bags of perlite.

3. The formula I use is an obsessive compulsive's dream but it grows the best Adeniums. Adeniums are not succulents and don't like to dry out between watering. So water storage capability in a planting mix is important. But it is also best if all the ingredients in the mix have a permanent particle size of over 1/8 th of an inch in order to provide aeration.. The mix is somewhat expensive but affordable considering that a good grafted Adenium can run $25.

   1. One 15 lbs. bag of plant growth aquarium gravel. The trade names are "Flourite" and "Flora Max" (PetSmart has them, Petco doesn't have them) ($17 per bag).
   2. Two $1 seven pound bags of "EverPet Basics Litter Unscented" cat litter from the Dollar General Store. Any cheap unscented non-clumping clay cat litter will do.
   3. One container activated charcoal for aquariums ($9 per 39 oz.).
   4. One container ammonia absorbing zeolite for aquariums ($11 per 36 oz.).




Activated charcoal

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Ammonia absorbing Aquarium Zeolite

Note that all ingredients have permanent particle sizes between 1/8th and one quarter inch. This is vital to maintain air between the particles. All the particles adsorb water, another important point.

Volume wise it turns out to be about 1/3 "plant growth" aquarium gravel, 1/3 cat litter and 1/3 the combination of charcoal and zeolite. The ingredients in the formula I use are enough to pot up three desert roses in three 12 inch 2 gallon planters (note that I use PetSmart for these last two planting media ingredients, Petco is so overpriced it is ridiculous!). The cost comes out to about $13 per planter, not bad for a long term investment which will last the life of the plant (it won't pack down, which is essential for Desert Rose to survive!). Note that the charcoal and the zeolite are important components of the mix and shouldn't be skimped on. This mix has it all, excellent aeration and porosity, excellent cation exchange capacity, excellent water storage and 100% of the components are permanent, they won't decompose and pack down over time. It provides plenty of Calcium and Magnesium sources.

This mix will grow a show quality plant without having to undertake the risky proposition of repotting. Repotting always sets a plant back a bit and can result in dead leaves and dormancy, which of course is undesirable for a desert rose. The "plant growth" aquarium gravel can be replaced with cheaper and lighter perlite with limited loss in performance (you lose a limited amount of water storage capability and a limited amount of cation exchange capability, which is the ability of the media to store nutrients for the plant).

This mix has a commercial equivalent. It is "Bonsai Soil" 21 lbs. for $35 from Wigert's Bonsai Nursery in North Fort Myers. This soil mix consists of lava rock, "Turface", and pine bark in equal 1/3 proportions by volume. The lava rock in the "Bonsai Soil" is only a little different from plant growth aquarium gravel rock, with larger pores (and less cation exchange capacity). The "Turface" is calcined clay, identical to the calcined clay in cat litter, probably from the same manufacturer. All calcined clay products come from one mine in the panhandle of Florida. The ad for Turface (identical to cat litter) says:

> "Turface granules have 74% pore space which allows them to hold water and oxygen in a nearly perfect balance. They also store nutrients vital to plant growth.
> - Stable particles have less than 5% degradation in 20 years.
> - High nutrient storage (CEC of 33 meq/100g).
> - Nearly perfect balance between air and water porosity."

The same holds true for cat litter. I replace the pine bark with activated charcoal and zeolite (high cation exchange materials) as the pine bark has little cation exchange capacity and the pine bark will decompose with time, compress and rob Nitrogen from the plants. The price for the two mixes is virtually identical pound for pound. If clay cat litter cannot be obtained the litter can be replaced with perlite, tufa, pumice or pea gravel. It just won't work as well. Zeolite and small particle charcoal can sometimes be obtained cheaply and is an excellent replacement for cat litter.

Do not add Milorganite fertilizer to the mix. I made this mistake once and had no blooms for two years. Milorganite has too much Nitrogen in it. Just a word to the wise. Most of the information on desert roses on the Internet would be disastrous for South Florida. The recommendations might work in Arizona or in a labor intensive operation in Thailand but they definitely won't work outside in the rainy season in Florida without frequent repotting! Quoting one internet source:

> "We like to repot our large prize specimens every 3 years or so with fresh soil because as the soil breaks down drainage decreases and roots become deprived of oxygen. As the roots

become deprived of oxygen flowering decreases, growth slows and plants become more prone to rot especially during winter months"

The key here is that the grower here is using organic soil which DOES break down over time. Organic soils need to be replaced with new soil every few years. All three suggested non-organic material mixes above DO NOT break down over time. There is no need for "fresh soil" and repotting as the suggested material mixes don't pack down and drainage never decreases.

Potting of Adenium
Mix the ingredients thoroughly, and put them in planters which have the many holes through them made with a soldered iron. Always add a one inch layer of pea gravel at the bottom of the pot for good drainage and aeration.

1. After cleaning <u>all</u> the old media off the roots of the Adenium to be repotted, the roots can be dusted with a rooting hormone such as Hormex or Rootone to speed up the repotting process.
2. Then plant the Adenium with the entire stem (the fat “caudex”) well out of the planting media. Much of the caudex in many store bought Adeniums is below the soil line so don’t be afraid to sit the whole caudex out of the soil and trim off any small roots that are coming off the caudex portion which was below the soil. Some growers, especially bonsai growers, expose all of the caudex, including the caudex below the soil line, each time they repot the Adenium to give a nice artistic twisted and gnarled look to the lower caudex of the plant. The newly exposed caudex won't sunburn in Florida.

When a Adenium is repotted it is quite normal for it to lose all its leaves. Adenium are much like weeping figs, change anything in their environment and they tend to lose their leaves. Just keep watering it and the Adenium will come back. Initially the Adenium can be watered with a <u>very weak</u> solution of liquid rooting hormone such as “Dip-n-Grow” in distilled water (Tap water will neutralize the acid rooting hormone).

Fertilizing of Adeniums
The unhybridized forms of adeniums found in nature grow and bloom well in very infertile soil. But the hybridizing process changes that. The hybridizing process consists of making crosses and planting thousands of seeds. These seeds are heavily fertilized to maximize growth. The one or two plants out of the thousand that bloom well under conditions of heavy fertilization are the “selected” for further hybridizing. Most hybrids are the result of tens of generations of such high fertilizer condition selection.

99% of the plants sold are much hybridized adeniums and are heavy feeders. Using timed release pelleted fertilizer and recommended rates of soluble fertilizer it is difficult to overfeed an adenium. Use 1 level tablespoon “Miracle-Gro Water Soluble Rose Plant Food” 18-24-16 per gallon to water every week to every month (once a week during the rainy season, once a month after the rain stops). More fertilizer gives larger plants with more blooms. The ideal Adenium food has low nitrogen, moderate phosphorus, and high potassium, a “1:2:3 ratio” according to the book “Adenium: Sculptural Elegance, Floral Extravaganza”. Unfortunately “Miracle-Gro Water Soluble Rose Food” 18-24-16 (basically a 1:1.3:0.8 ratio) is about the closest one can get to the “ideal” without mixing a special fertilizer. One can use a Potassium Sulfate 0-0-50 and the rose food to make close to a 1:2:3 fertilizer. Use one half teaspoon Potassium Sulfate fertilizer (get off Ebay) per gallon of hot water and set it overnight to dissolve, then add two teaspoons Miracle Grow Rose Food <u>after Potassium Sulfate dissolves</u> (it dissolves very slowly). Do not use a high Nitrogen fertilizer. High Nitrogen will give you an Adenium with no blooms.

If your water is "soft" and there is no Calcium in the soil media being used (sand or totally organic media), dolomite lime will need to be added twice a year in small amounts (one third teaspoon mixed into the soil mix or into the fertilizer). This will only happen in South Florida in a City where the irrigation water is softened, like LaBelle. Well water here is very rich in Calcium and Magnesium. Adeniums need Calcium and Magnesium in about a 4:1 ratio in order to grow well and actually like our hard alkaline well water.

Be careful about using organic fertilizers such bone meal, blood meal, feather meal and fish fertilizer. Local critters dig up anything planted with these organic fertilizers.

Winter Dormancy of Desert Rose

Desert Roses never experience temperatures below 50 degree Fahrenheit in their native lands. When night temperatures start falling below 50 degrees consistently for days at a time Desert Roses go "cold" dormant even if they have water. And "cold" dormant desert roses don't like water, period. “Cold” dormancy is an unnatural state for desert roses and when they are in “cold” dormancy they tend to shut down their natural defenses against fungi and bacteria. During "cold" dormancy an Desert Rose is very prone to wet rots caused by fungi and bacteria.

What typically happens when night temperatures drop is that the leaves of the desert rose start to yellow and drop off as it enters "cold" dormancy. This is perfectly natural and will continue typically until there are no leaves left. Unfortunately at the first yellowing of the leaves the novice grower will panic and start watering the Desert Rose to prevent further yellowing. This will kill a desert rose. If night temperatures have been below fifty for several days one must let the leaves fall and STOP watering.

At the first sign of weather with four days or more of night lows below 50 degrees Desert Roses will enter "cold" dormancy and must be brought into a dryer and slightly warmer covered environment such as a garage, a shed, or a covered enclosed porch. "Cold" dormant desert roses don't even need light. Once the desert roses are under cover only water lightly once a month, even if the plants retain their leaves. Root rot due to excessive moisture during the "cold" dormant winter months is probably the biggest killer of Desert Rose. Leaving desert roses out under a timed irrigation sprinkler system in the winter (typically in LaBelle this is about December 15th through February 15th) months is sure death. Even infrequent winter rains can kill "cold" dormant desert roses if they are left out. In addition to dying from too much water during the winter "cold" dormancy, desert roses will also die in a Florida freeze if they are not very well protected from the low temperatures.

When the warm spring weather arrives the desert roses can be put back out in full sun and watered frequently, carefully watching for those occasional late frosts which will require the plants to go back inside. The flowers typically come out before the leaves. If the Desert Roses haven’t been fertilized for at least four months it can be quite a show.

Now it is possible to bring desert roses inside the house in the winter and to grow them on and have them flower. The key is to give them as much sunlight as possible in the house. A south or west facing window is a must for flowering. The Desert Rose will live with less light or artificial light but it will only flower sparingly at best.

Types of Desert Roses

There are actually many types of desert rose; large and small caudexes, variegated, reddish or green foliage, frilled flowers, large flowers, striped flowers, yellow, white, pink, red, blackish red and black flowers. There is no true yellow, purple or blue Desert Roses and photos which show such flowers

are photoshopped. Some desert roses are have double petals and look just like small double camellias or roses.

Note that the best desert roses are grafted, not seed grown. Other good Desert Roses are grown by rooting stem cuttings of desirable varieties. Note that stem cutting started plants will typically not get the large fat caudexes of seeded or grafted plants. A caudex is an enlarged stem and/or root area which appears very fat and engorged. In desert roses the caudex stores water for the plant and is considered part of the charm of desert roses by most people. But then some people don't like the fat caudexes.

a few double Desert Rose varieties.

The artistic plant above was probably grown in a compressible organic media such as coir and frequently repotted. With each repotting the large “root” caudex was more and more exposed. This can be done with compressible organic media. But it's a lot of work. Repotting a desert rose isn't easy. And each time the desert rose is repotted its growth is checked for several months. It won’t happen with the three media recommended above. The “root” caudex will be small or non-existent and most of the caudex will form above the soil line when the Desert Rose is grown in non-compressible media. Frequent repotting will not be necessary.

The claim has also been made that a shallow wide container is necessary to create a large, fat caudex. A better statement might be that a large “root” caudex will form below the soil line in deep containers with compressible organic soil media and needs to be exposed as the plant grows by careful repotting. With uncompressible inorganic media or a shallow container no “root” caudex will form. Planting the desert rose in a media which won’t decompose and which won’t compress favors the formation of a single fat caudex above the soil level (any of the three media recommended above won’t compress or decompose).

Growers in Thailand have a lot of cheap labor available and lots of cheap coir so they grow with compressible coir media and frequent repotting. Labor costs are higher in Taiwan and coir is more expensive so they grow with uncompressible rock media which doesn't require the repotting and which forces the Desert Rose to form large caudexes above the soil line. The plant below is typical of a plant grown in uncompressible media.

Personally I just start out with a permanent 12 inch 2 gallon plastic container, permanent, uncompressible media and don't repot until the container begins to fail from old age. I want as large of a single fat caudex as possible. I'll typically repot into a 15 inch diameter 3 gallon container. Anything larger than 3 gallons is just too heavy for my bad back to handle. If the Desert Rose gets really large and requires a large container I switch the potting media to one based on perlite.

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