

SUCCULENTS

FROM SEEDS

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DID YOU KNOW?



▲ Baobab trees are the Worlds Largest Succulents

Their root systems also retain water, there is no real wood inside a Baobab tree, it consists of fibrous material that is saturated with water, the weight of the tree is virtually all water, if the tree was to lose all of it's water, the tree would be a pile of porous pulpy material. The baobab is the national tree of Madagascar. The trees reach heights of 5 to 30 metres (16 to 98 ft) and trunk diameters of 7 to 11 metres (23 to 36 ft).



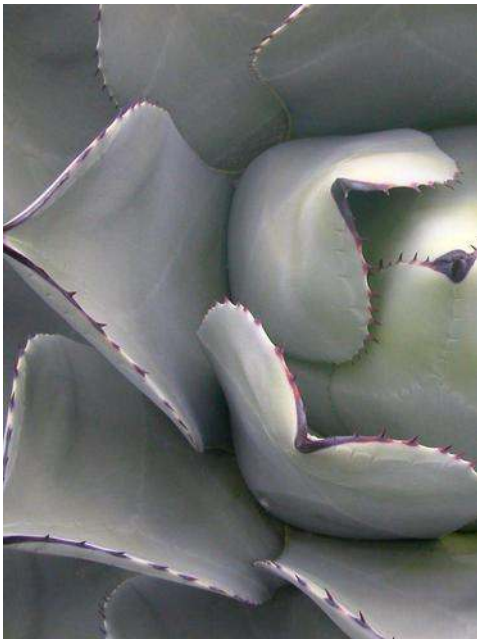
▼ The slowest-flowering plant

is the rare species of giant bromeliad *Puya raimondii*. The flower cluster emerges after about 80-150 years of the plant's life (it produces an immense vertical stalk or panicle bearing numerous flowers). Once it has blossomed, the plant dies.

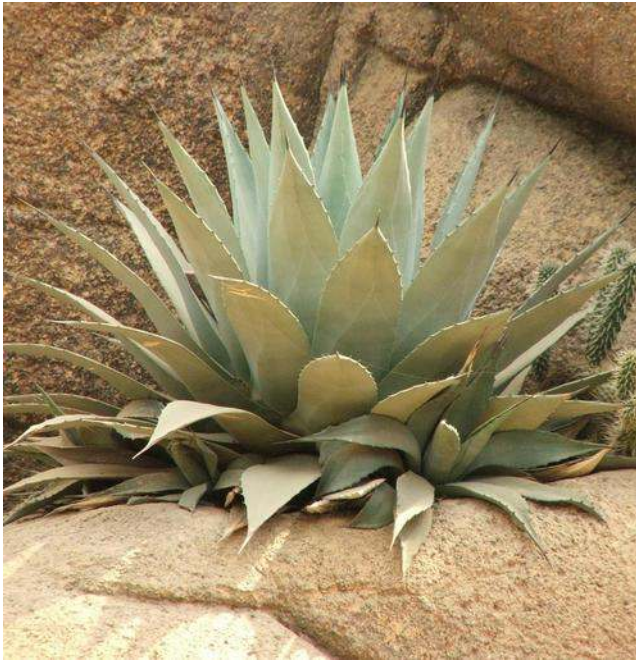


◀ In western cultures, succulents symbolize timeless and enduring love

thanks to their uncanny ability to persevere in rugged habitats. In Asian culture, on the other hand, they represent prosperity. Water is a symbol of wealth, and they are a sign of good financial fortunes



Agave, genus of the some 200 species of the family Asparagaceae, native to particularly Mexico, and the Caribbean. Agaves are characterized by a rosette of succulent or leathery leaves that range in size from a few centimetres to more than 2.5 metres (8 feet) in length, depending on the species. Most bear spines along the edges and the tip of the leaf, for which they are occasionally confused with unrelated cacti. The leaves range in colour from pale green to blue-grey and can be variegated or striped. The plants are generally monocarpic—meaning that each rosette dies after flowering and fruiting—and most do not live longer than 30 years. The yellow, pale green, or red flowers are borne in tall branching or unbranching inflorescences that can reach more than 9 metres (30 feet) in height in some species. Each flower consists of six petals and produces copious amounts of nectar. The flowers are pollinated by bats, insects such as bees and hawk moths, or birds, depending on the species. The flowers produce capsule fruits.



AGAVE FROM SEED

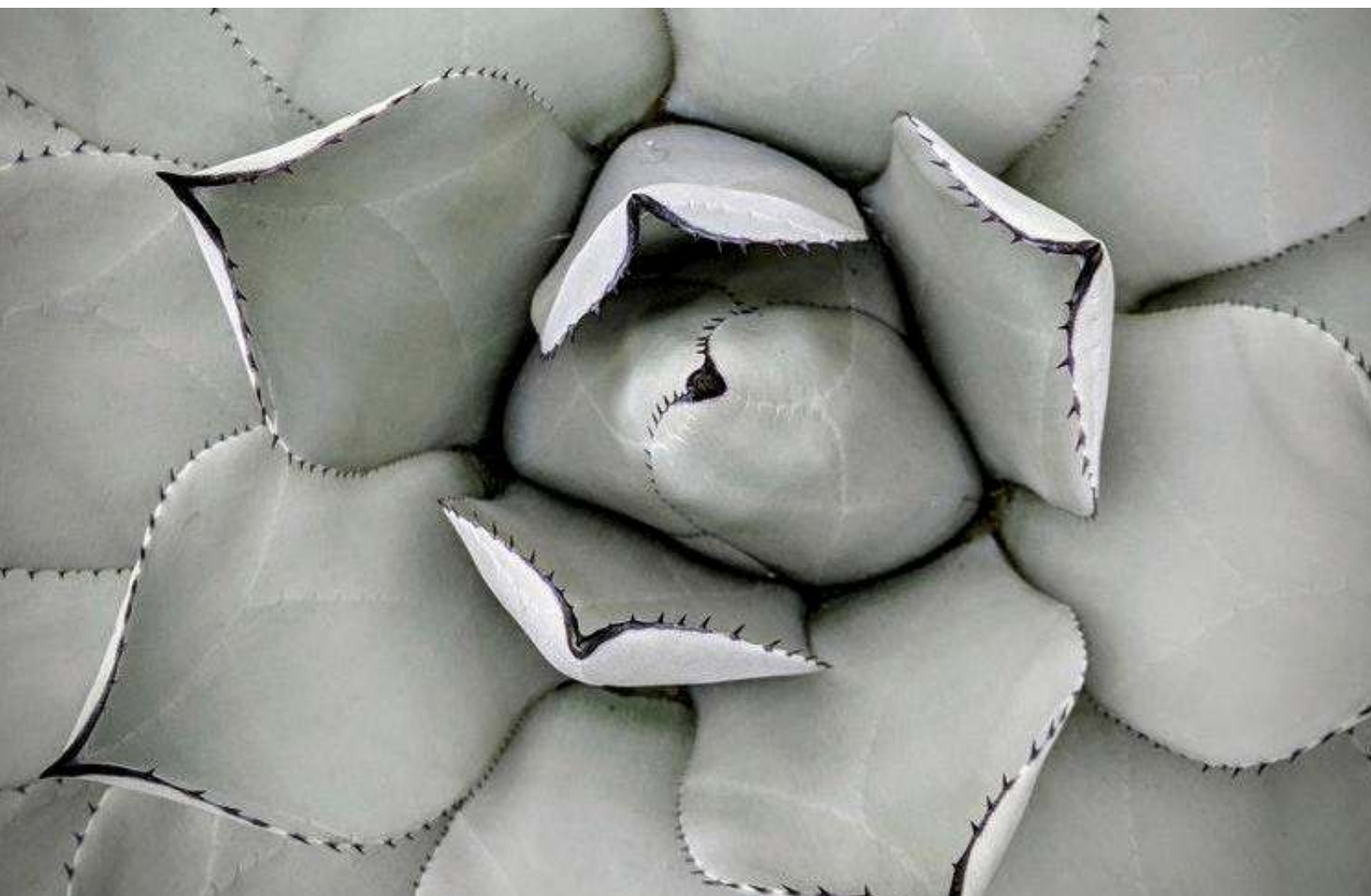
1. Mix equal amounts of garden soil, sand and broken brick perlite. Sterilize prepared substrate by putting it in a microwave for 3 minutes or in your oven for 45 minutes approximately.
2. Previously prepared containers for planting are to be filled with substrate, but while doing it, be careful and leave some space at the top, at least 0.5 inches (2cm). Add plenty of water and leave the container, so that the water has some time to decant.
3. Plant Agave seeds, but leave at least 0.4 inches (1cm) of space between each seed. Then cover the seeds again with a thin layer of substrate, and to finish it off, cover it with a thin layer of fine gravel, with grains no bigger than 0.12 inches (3mm). Water it again.

4. Moisture is the most important part for seed germination. It's best to cover the container with a piece of nylon or a plastic bag in order to keep it moisturized. The container with seeds should be put somewhere warm, but not exposed to direct sunlight. The temperature needed for Agave to germinate is 77°F (25°C) and above.

5. The germination can start as soon as 4 days after planting, but it's more frequent for it to start after 10-12 days. Remove the glass that kept the container moisturized 2 weeks after planting.

6. You need to spray the substrate every day, it cannot be let to completely dry off. It is also important to provide the plant with sufficient sunlight during the day, but avoid direct sunlight for a couple of months. It's of great importance for Agaves not to change its light regime during this sensitive period. Try to provide it with a similar amount of light every day.

7. Agave's seedlings have a tendency to fall over, which can be fatal for them. You can prevent that by adding some pebbles around the plants. Agaves bred from the seed start off as one leaf. The empty shell of the seed can stay at the top of the plant for a long time. You can take it off gently by yourself, but it's not necessary. The plant starts to form a new leaf four weeks after germination, so they start looking like mature Agaves. However, only after forming the third leaf will Agaves look more like their parents.



USDA Hardiness Zones: The majority of agave plants cannot withstand freezing temperatures and do better in zones 8 or higher. Some varieties (i.e. *Agave parryi*) can do well year-round to USDA zone 5.

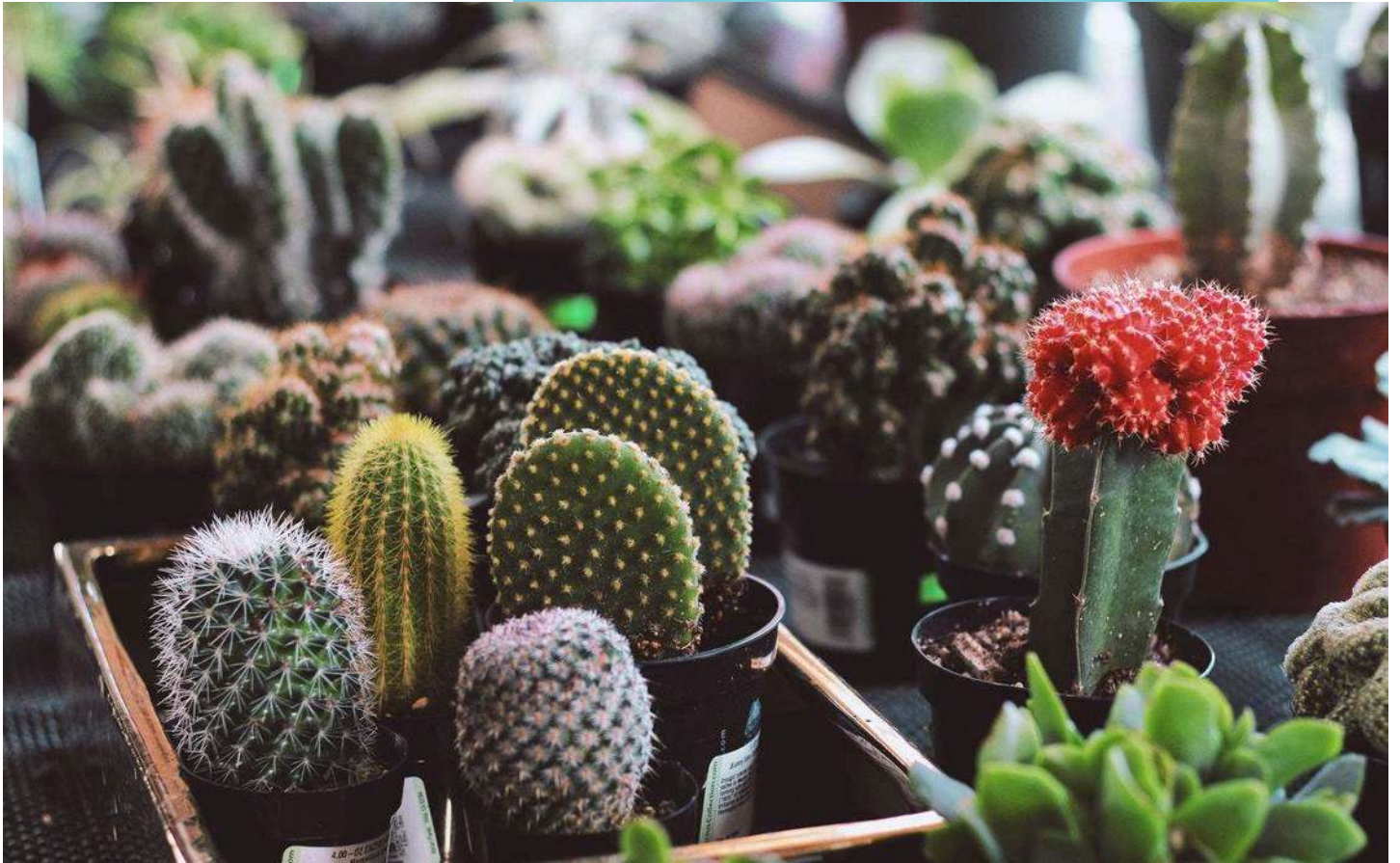
Foliage: Most agaves are stemless and produce succulent, strappy, pointed leaves in a rosette configuration. Warm climate varieties tend to be grayish-green. Cooler climate varieties tend to be blue-green. Several variegated varieties exhibit striations or stripes of white or gold.

Requirements: Love the full sun, some do well in partial shade. In locations with a scorching, punishing climate more shade is appreciated.

These plants like sandy, rocky, well-drained soil (no preference as to pH levels). Agave plants don't need fertilizing at all. Remember feeding produces flowers and flowering mean death to the agave.

Don't fertilize if you want your plant to live for a long time.

Water: Established plants need watering once every couple of weeks if at all. Deeply water, container grown Agave plants when the top inch or two of the soil dries completely.



A cactus (plural: cacti) is a member of the plant family Cactaceae, a family comprising about 127 genera with some 1750 known species of the order Caryophyllales. Most cacti live in habitats subject to at least some drought. Many live in extremely dry environments, even being found in the Atacama Desert, one of the driest places on earth. Cacti show many adaptations to conserve water. Almost all cacti are succulents, meaning they have thickened, fleshy parts adapted to store water. Unlike many other succulents, the stem is the only part of most cacti where this vital process takes place. Most species of cacti have lost true leaves, retaining only spines, which are highly modified leaves. As well as defending against herbivores, spines help prevent water loss by reducing air flow close to the cactus and providing some shade. In the absence of leaves, enlarged stems carry out photosynthesis.



1. You can get the substrate used for planting cacti by mixing garden soil, fine sand (granulation up to 2 mm) in even proportions and by adding small pieces of broken bricks or perlite. This last ingredient is very important for cacti because it allows better substrate drainage. If the substrate doesn't have good drainage, there is a chance that most cacti will die during germination. need to cool the substrate off after that.

2. You can use containers of any kind for planting cacti. They don't need to be deep; about 1.5 inches (4cm) is enough. The important part is that the container has holes at the bottom to let off the water surplus, and the more it lets off, the better. You can lay the bottom of the container with small pebbles, so the hole doesn't clog up with substrate. One container can hold a few seeds, there is no need to separate them, and it isn't recommended either because cacti like to be close together.

3. Put the prepared substrate in chosen container, shake it and softly tap the surface so the soil can settle, there should be no air left in it. Be careful not to overfill the container, so leave about 0.8 inches (2cm) from the top.

4. Water the substrate plentifully and leave it, so the water surplus can drain off. It is recommended to water it by submerging the container.

All cacti are succulents, but not all succulents are cacti

If you want to go down the easier path, simply buy a Cactus mix. Sterilize the substrate to avoid fungus appearance, which can completely destroy all seeds. You can use any kind of fungicid. But it is enough to simply bake the substrate in a microwave for at least 3 minutes or in an oven for 45 minutes. You

5. Lay the cactus seed on the moist surface of the substrate and gently tap it with a flat object. You shouldn't do it with your fingers under no circumstances. It is usually not required to cover the seed with another layer of substrate, except when it comes to bigger seeds.



6. You can keep the substrate moist with see-through glass, foil, plastic bag or something similar. It is important to keep the distance between the substrate and glass. Drops of water on the glass indicate if the amount of moisture is enough or if you should additionally water it.

7. The container with seeds should be put on a bright spot, not exposed to direct sunlight. The temperature needed for seed germination must be over 68°F (20°C). Cacti can be bred from seed at any time of the year, if you can provide them the afore-mentioned warmth and moisture, and later on, light for at least 10 hours a day. During the winter period, you can achieve this by using artificial light source.

8. Depending on the cactus breed, it will start growing in a week or in a couple of months. Until the germination process starts, you cannot open the container. When the first cacti start appearing, gradually let the fresh air in every day, but not by opening the container completely and exposing it to the external climate. You should open it gradually, day by day. If you immediately expose baby cacti to external climate, more than 80% of it will surely die off, and the rest will shrivel up. You can open the container completely when you determine that your cacti are strong enough. It is considered that in order to achieve best results, you need to keep them covered and under strong light, for at least 6 months.

9. Young cacti do not need to be separated until it's absolutely necessary. This means that they can stay together up to two years. Plants that have just went through the germination process are not as sensitive to water as mature plants, so you shouldn't let the substrate dry completely. It's best to spray them every day.



Cacti Maintenance

Place: As it is widely known, Cacti are tropical plants, so they can stand extremely high temperatures. Feel free to keep them in strong, direct sunlight. On the other hand, it's not recommended to expose them to the afternoon sun right away. It's recommended that the plants go through a couple of days of adjustment, especially young plants. It's best to take them out as soon as the last winter days pass, that would be sometime around the end of March.

Substrate: Cacti love poor, loose soil. Garden soil and construction sand mix suits them best in 1:1 proportion. You should add pebbles or perlite for better drainage to the mix.

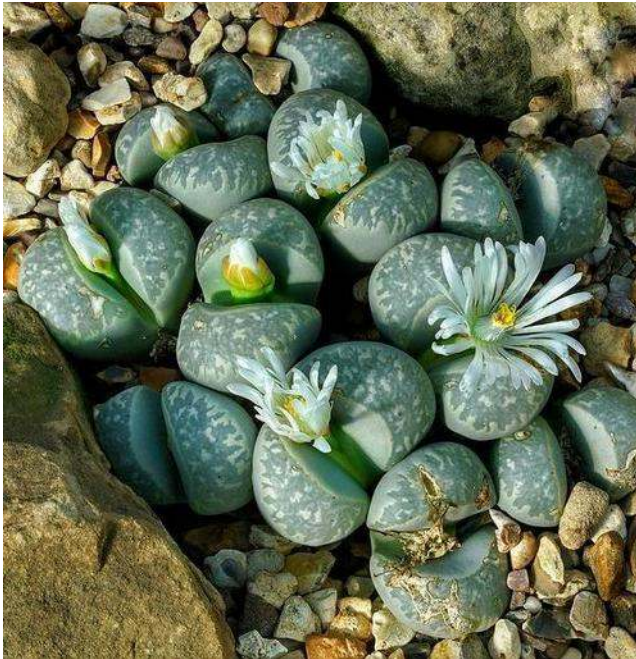
Repotting: Cacti love crowded space and you don't need to repot them for the first few years. Too big pots can be bad for them, so the rule applies that the pot should be as big as half an inch (1cm) in diameter around the plant. If you think that it lacks soil, lift the whole plant with the existing soil and add some fresh substrate down below.

Watering: You should water it regularly during summer, about 3 times a week, when the air temperature is high. Be sure to check if the soil is dry before every watering. You should stop watering it during winter completely. If you notice that it needs water, you can water it up to 3 times during the period from November to March.

Wintering: The lowest temperatures that Cacti can stand differ depending on the Cacti type. So some Cacti can stand as low as 32°F (0°C), while some can stay out during the whole winter, under the condition that they are shielded from precipitation. However, most Cacti need to be provided with winter sleep, in a relatively cold room around 32°F (0°C), with as much light and as little watering as possible. Cacti can spend winter in a warm room but then more frequent watering is required, at least two times per month, and it needs much more light. In that case you should pick a spot most distant from a source of warmth.

Topdressing: Cacti don't have any special topdressing requirements. You can use topdressing during summer months with any Cacti topdressing, but it is not necessary to do it at all.

Blooming: There are breeds which never bloom, those that bloom as early as in their first year and those that bloom only after a few years of germination. Will the cactus bloom depends on proper maintenance.



LITHOPS

1. Sterilize substrate (3+ minutes in microwave or 50 mins in oven- (350°F/ 180°C) and let it cool)
2. Mesembs (Lithops, Conophytums...) require a well draining soil, which means it dries out quickly. Soil should contain a lot of pumice, perlite or sand. Sand should consist of many sizes of particles, from dust to 1/8". The basic soil mix is 1 soil mix to 3 pumice and sand. Remove any big chunks (peat) from the potting soil.
3. Planters should be about 1-1.5 inches deep. Fill a container with good draining soil. Leave 1/2 inches to the top free. Press the substrate, equally.
4. Disperse pebbles granulated up to 0.2 inches
5. You can sow 50 -100 seeds into one planter 3x3 inches. Mesemb seeds are very tiny.
6. Equally Water the substrate with water (boil and then let it cool) - place a piece of a napkin on top of the substrate and slowly pour the water over it.
7. Let the container soak up water for 5 minutes. Leave the container to drain out the water surplus.
8. Mix some fine sand to the bag with seeds, and sprinkle contents of the bag onto the substrate and pebbles. Do not cover with too much soil or the seeds may not germinate.
9. Put the whole container into a zip bag to keep humidity.
10. Avoid exposing to direct sunlight, but provide them light on some bright place, temperature should be about 77°F / 25°C.
11. The germination process usually starts within 4-7 days but some seeds can germinate after month or two. Don't expect all the seed to germinate at the same time.
12. Start opening the container gradually so that the seedlings can get used to the new air conditions. Remove bag completely after a month.
13. Seedlings need some moisture, substrate shouldn't be dry, but don't overwater. and they need an ample amount of light – but not direct sunlight! you need to take care of them constantly next 3-5 months.
14. Repot them when you notice that seedlings are space-limited, which is usually in a year.
15. Buy only seeds from reputable sources like www.rareplant.me. That way you will avoid scams, fake or bad seeds, and you will always get fresh ones.



Once you get a handle on the basic requirements, growing them will quickly become an obsession. Lithops grow well in shallow containers in a controlled climate environment such as a greenhouse. The annual cycle of a lithops begins in late spring, when in response to moisture the existing leaf pair starts to increase in size. Depending on species, at some time between July and December in the northern hemisphere, a single flower bud will force its way through the fissure and open to a daisy-like flower that can be as large as the plant body and lasts for about a fortnight.

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It's best to put the pot in a plastic freezer bag and close it, so it maintains the moisture. Keep it somewhere bright, but don't put it under direct sunlight. It should be exposed to the temperature between 77 to 86°F (25 to 30°C). When the seed germinates, you can move the pot to a bit cooler place, room temperature should be 60 to 77°F (20 to 25°C). Plastic bag kept for moisture should be taken away only after a few days, after the seeds germinate. Seedlings shouldn't be overwatered because it's not good for the plant to be too moist, but you can't allow for the substrate to completely dry off either, because that will significantly influence the development of the plant

Stapelia from seed

Prepare the standard Cactus substrate. It's extremely important that it has good drainage. Another thing of vast importance is that you sterilize the substrate before planting. You can use oven, or to make the process even faster, a microwave. All plants that belong to this subgenus are very sensitive, so it's important to use fungicides after germination too. Soak the substrate with water from below, until it absorbs enough water, so that it's moist on the surface too. Plant the seeds to the substrate, and then cover them with a very thin layer of substrate, use as much substrate as to you need to barely cover the seeds. You can additionally moisturize the substrate with a sprayer, but be careful not to reveal the seeds.



ECHEVERIA FROM SEED

1. Sterilize substrate (3+ minutes in microwave or 50 mins in oven)
2. Planters should be about 1.5 inches deep. Fill a container with good draining soil. Good drainage is important, 50% regular potting soil with 50% coarse sand, perlite or pebbles (~0.15 inch)
3. Echeverias have tiny seeds which should not be covered with soil. They germinate best at 18-20 °C temperatures. It is important to maintain the correct temperature, as Echeveria seeds do not germinate above 70 degrees Fahrenheit (21 degrees Celsius).
4. Equally Water the substrate with water - place a piece of a napkin on top of the substrate and slowly pour the water over it.
5. Let the container soak up water for 5 minutes. Leave the container to drain out the water surplus.
6. Spread the seeds over the substrate, leave some space between them. 7. Put the whole container into a zip bag to keep humidity
8. Avoid exposing to direct sunlight, but provide them light on some bright place.
9. The germination process usually starts within 4 days – 2 weeks
10. Start opening the container gradually so that the seedlings can get used to the new air conditions. Seedlings need some moisture, substrate shouldn't be dry, but don't overwater. and they need an ample amount of light – but not direct sunlight
11. Repot them when you notice that seedlings are space-limited
12. Examine pots daily for fungus infection. Treat with fungicide if appears
13. Buy only fresh echeveria seeds, and only from reputable sources, like www.rareplant.me

Water moderately from March to September and allow the plant to dry between waterings, avoid getting the leaves wet they do not welcome overhead waterings!!!. Overwinter in a cool and ventilated environment and keep plants dry, Hardy to -3°C. Need a full sun position but tolerate light shade (Shrivelling up and falling of leaves along with gaps in the leaf spaces may indicate low light levels... this means that it is necessary to increase the amount of light gradually over a few days to a week)



Echeveria Care

Place: You can take care of Echeveria in a very bright place with a couple of hours of sunlight. If you leave the plant in a constant shadow, the plant will deform and the new leaves will be light in colour and tilted.

Substrate: This plant belongs to a family of succulents, so it doesn't need too nutritious a base for growth. The optimal substrate mixture for growth should contain garden soil, sand, pebbles, broken brick pieces... If you add a small amount of hummus then you don't even need to fertilize it.

Repotting: You should repot the plant after the blossoming occurs, but not every year. You should wait for the current container to become small for the plant, then repot it in a slightly bigger container and add fresh substrate.

Watering: You should water the plant during summer only when the soil is completely dry. It's for the best to water the plant abundantly and let the water decant completely. You shouldn't water the plant during winter at all. However, if you notice that the plant needs it you can water it up to three times during the period from November to March. Be careful and don't spill any water over the leaves when watering the plant.

Wintering: Echeveria is not winterproof. This plant can spend winter on the temperature from 50 to 54°F degrees (from 10 to 12°C degrees). The plant can be at a lower temperature too, and you shouldn't water it in that case. If you can't provide these winter conditions for Echeveria, then take it in a warm room and place it on the farthest spot from the source of warmth, but at the same time, the brightest.

Topdressing: this should be applied every three weeks or once a month, but only during the growth period (from May to September).



ADENIUM FROM SEED

1. Submerge the seed few hours in lukewarm, room temperature water. You can use warmer water too, it's just important that you don't use boiling hot water. This will make the germination process faster for a day or two. Don't worry if the seed doesn't sink. Adenium seed usually floats even after sinking it in water, as opposed to many other seeds.

2. You can use any kind of substrate, as long as the drainage is good. Coconut turf is ideal, just as is cactus soil that you can buy. Standard garden soil can do well at the beginning, but later on and during winter, it may become problematic due to poor drainage.

3. Plastic cups can serve you well as flowerpots during the first few months, and there's no need for bigger pots. The only important thing is to cut out holes at the bottom. The depth of 1.5-2 inches (4-5 cm) is more than enough for the first few months of growth.

4. First you need to water the substrate, so it can lie down; and then afterwards put the seed **HORIZONTALLY** on soil and **DO NOT PUSH IT**. Then cover the seed with a very thin layer of substrate, do not go over 0.2 inches (half a centimeter). Water it again and be careful, as the water stream can move the seed or uncover it. Sprayers will be extremely useful for this task. Feel free to water it, until the water starts flowing from the flowerpot/plastic cup.

5. Leave the flowerpot for a few minutes for the water to drain.

6. Keep the substrate **MOIST** during germination. You can cover the plastic cup with nylon and tie it with a rubber band, to keep the moisture at a high level. This is **THE MOST IMPORTANT STEP** for germination as it affects the germination percentage the most. The soil shouldn't dry until the seed germinates, and it has to be damp (but not completely covered by water). I've personally come to the conclusion that the best combination for the germination process consists of cake cover, underneath which I put small pots or plastic cups. In this case, you don't need to put nylon covers over them, because the cake cover will provide more than enough moisture and air. Another solution may be a plastic fast food box, with a useful cover to keep the moisture. In this case, you can plant your seeds directly in those boxes, provided that each seed is at least 1 to 1.2 inches (2.5 to 3cm) apart.

7. Uncover the nylon every day, so that the fresh air can come in. That nylon-pause should last 10-20 minutes, and then cover it again. If the substrate doesn't dry off during germination, and is constantly moist, that means that you did a good job. But, if you notice that the substrate is dry on the surface, be sure to spray it a bit, because the seed shouldn't be in a dry substrate.



8. Your flowerpot has to be on a well-lit place, but **UNDER NO CIRCUMSTANCES** exposed to direct sunlight, because the seed will overheat in hot soil, and after germination, it will burn out. Ideal temperature is up to 77 to 95°F (25 to 35°C). It's not a problem if that temperature drops to 62-64°F (17-18 °C) over night, but it's desirable that it's over 77°F (25°C) during the day. The seed will germinate even in a room of 70-71°F (21-22 °C) but that will extend the germination time, and probably decrease germination success rate.

9. The largest number of seeds will germinate between days 3 and 5, if you've provided optimal conditions. If there wasn't enough moist or the temperature didn't go over 77°F (25°C), germination will last longer. It shouldn't last longer than 10 days. There are examples when the seed has germinated even after a few months, but that doesn't happen very often.

10. When the seed germinates, you can leave the nylon cover for a couple more days. Feel free to take it off later on, and don't cover the seed afterwards.

11. When the seed germinates, it will usually dispose of the seed shell on the leaves on its own, but it's stuck sometimes, and the leaves can't open. If it doesn't fall off in 2-3 days, feel free to **GENTLY** remove it, otherwise the seedling may die off. This can be done easily by spraying the plant first, so that the shell softens, and then gently, with your nail, push the shell **FROM THE BOTTOM**, and it will easily slide off. If you pull the shell from the upside, you can easily break the leaves. Even if you do this, don't throw away the plant; instead give it a chance to create some new ones.

12. During the first 2-3 months after germination, the seedlings need to be under a strong light and on a warm spot, up to 100°F (38°C), but under no circumstances should you expose them to direct sunlight. Only after 2-3 months you can slowly let your plant get used to the sun, but first expose it for an hour or two early in the morning or late in the evening, when the sunlight is not too strong.



Adenium maintenance:

The most important requirement for fast growth in young plants in an ample amount of light and warmth. If you sow during winter, when the days are shorter, try to put the plant close to a powerful light bulb or next to a window. That should be the window which gets the most light during the day. If the plant doesn't get enough light, it will grow in height, not width. Approximately after 2-3 months, let the plant gradually get accustomed to direct sunlight, but don't let it spend the day under direct sunlight during the early phase. Try to leave it at a spot where they will get 1-2 hours of light during first 5-6 months. After that, you can leave the plant under the sunlight for longer periods of time, and after the first year it can be under sunlight all the time (provided that it was accustomed to it beforehand).

Warmth is extremely important and the ideal temperature is 77 to 95°F (25 to 35°C). When the daily temperature exceeds 95°F (35°C) it's desirable to move the plant away from direct sunlight, because it can cause burns. When it comes to low temperatures, Adenium can tolerate as low as 50°F (10°C), so if the temperature during night starts falling below that, it's time to move the plant into the house. Older plants are somewhat more resistant and they will survive a couple of nights below 50°F (10°C). However, it's for the best to take them inside.

Watering: Although it is thought to be a desert plant, Adenium likes to get plenty of water. The hotter and sunnier the weather, the more water it needs. The most important thing is the drainage of soil. If the drainage is good, and the excess of water flows out fast, you can even water it daily. On the other hand, it's a safe bet to water it every 2-3 days during summer. You should simply wait for the substrate to dry, then water it, be it once a day or once a week. If the soil has poor drainage, and the root is constantly in the water, it will rot, and that will be the end of it. When it comes to young plants up to a couple of months of age, they cope with the excess of water much better, so do not allow the substrate to dry completely.

Substrate: Adenium will thrive in almost any substrate, as long as it's light and combined with good drainage, so that the roots can breathe. A good option would be to use a cactus mix of a kind, which contains quartz sand. You can use any sand, perlite, broken brick or anything with granulation 0.07-0.15 inches (2-4 millimeters), which will make the drainage better and mix it with garden soil bought in a store. Coconut peat is also a great choice, but be aware of the fact that it doesn't contain any nutritious materials, so you must fertilize the soil on a weekly basis.

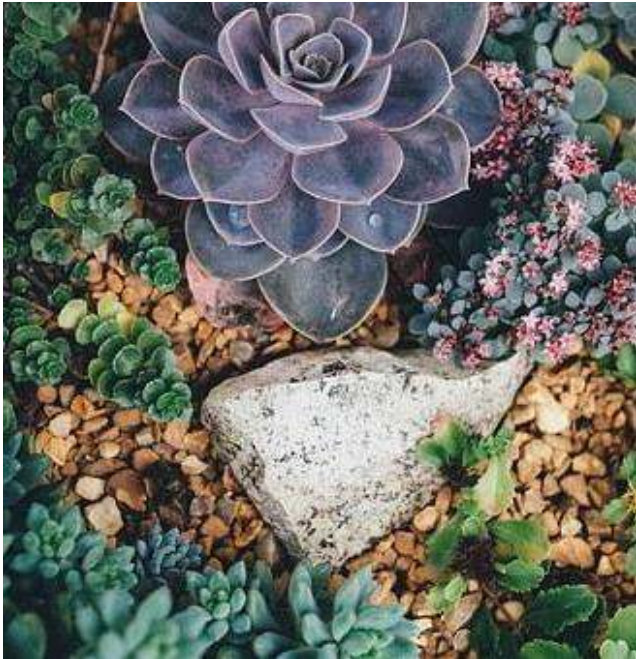


10 Beginner Mistakes Growing Succulents

Succulent  City

Have you been scrolling down checking succulent images on Facebook or Instagram for hours on end? You hop over to Pinterest and as you browse more images, you can't help going, "wow" on every single one of them. And lately, your living room has been teeming with succulents wherever there's available space. We totally get it! Looks like you just joined millions of other self-confessed succulent lovers. Succulents are extremely easy to love and growing these charming plants is quickly becoming a hobby all over the world. And that is no surprise at all –with such striking and quirky looks, growing succulents is more than an adventure.

Hordes of plant lovers are fast getting hooked to succulents. If you're new to the obsession, you definitely want to avoid a few pitfalls when it comes to growing succulents. As much as it is claimed that succulents are easy to kill, they may die on you when they're denied the appropriate growing conditions. Avoid the following mistakes to end up with healthy-looking succulents.



But with succulents, light is critical and tucking that Sedeveria at your living room's corner is just begging it to die or become etiolated. You don't want your succulents looking stretched, pale and lanky. Majority of succulents require a minimum of four to eight hours of sunlight every day. This helps them to make food through photosynthesis so that they can be healthy. If growing succulents indoors, it's recommended to place them on a south or west facing window. During summer, you can take them outside and let them bask in the sun during morning or late afternoon hours. If the natural lighting in your house is needing, a grow lamp may get the job done.

Placing Succulents in Poorly Lit Spaces

Okay, so you heard that succulents are versatile and have been adapted to growing in harsh conditions. Since they grow in deserts and literally anywhere, they can even survive in closets or in the basement. Wrong. Every green plant, regardless of its adaptations requires light to survive (remember photosynthesis?). True, there are some low light succulents that can do well in little light, but they also need to be exposed to light for a minimum number of hours every day. What's more, minimalist home designs are increasingly becoming popular by the day with succulents as the go-to house plants to achieve the style. These elegant and simple plants make a perfect fit for such designs. However, most home decorating designs don't make provisions for stuffing many plants on the windowsill, minimalist especially.

Failure to Observe Fertilizing Best Practices

A number of succulent gardeners believe that succulents don't need fertilizer. While most succulents can do perfectly well without any fertilizer, it's important to note that nutrients are necessary for any plant. Feeding your plants may increase their growth rate and give them a healthier look. A common mistake that's prevalent among beginners in feeding succulents is overfeeding. It's recommended to feed your plants three to four times a year. The best time for this is during summer or spring when your plants are actively growing. Succulents are generally dormant during winter so avoid feeding them during this time.



Crowding too many Succulents in One Space

Growing different succulents in one place presents a spectacular aesthetic. And to some extent, succulents can get along with this better than other plants. However, squeezing many of them in a single space presents a few problems. Competition for nutrients becomes fierce which may lead to malnourishment. Additionally, excessive crowding of succulents may encourage pest infestations and even the spread of mold. Such a combination of succulent killers is deadly and may wipe out your entire collection.

Not Giving Your Succulents Enough Water

Another succulent faux-pax is the notion that they can survive without any water. Though xerophytic and adapted to desert conditions, succulents require enough water in order to store some in their leaves. A desert may experience long spells of drought but when it rains, it pours. It's recommended to mimic such watering as succulents are adapted to this. Let loose a deluge on your succulents and wait till the soil is bone dry to water again. Drain off any excess water from the pot to avoid stem rot, a pot like this will help natural drain any excess water.

Planting Succulents with Non-Succulents

Different plant arrangements are just gorgeous. No doubt succulents look good when paired with some ferns or moss varieties. Unfortunately, that can only be done temporarily. Succulents have very different growing conditions as compared with other house plants. Basil needs water like every six hours or else it'll begin to wilt. Similarly, a moss plant will thrive in an environment that's moist throughout. On the other side of the ring, succulents can't stand being wet. It's literally impossible to have a cohesion without one of the plants dying. This is also true for some succulent groups. While a few succulents can go on without water for weeks, some need to be watered on a weekly basis.



Using Inappropriate Planters or Pots

Succulents appear even more beautiful when planted in fashionable planters. However, if your container is jeopardizing the growth of your plants, you'll soon end up with an empty planter. Succulents are prone to root rot. This happens when they sit in wet soil for too long. Soil in containers without a drainage hole takes much longer to dry out increasing the chances of root rot. Similarly, partially-closed containers leads to higher levels of humidity around your succulents. This is risky as it also promotes rot especially in the leaves and stem. You can never go wrong with Terra cotta, wood or hypertufa containers.

Misting Succulents

This emanates from the belief that succulents don't need a lot of water and so misting is the way to go. Nothing could be further from the truth... Not only is misting a terrible way to water succulents, it also promotes leaf rot as most people who mist succulents do it on a daily basis. Leaf rot is due to the fact that most of the water remains in the leaves for extended periods of time. This is dangerous for succulents such as *Kalanchoe tomentosa*.

Using Standard Potting Soil When Planting Succulents

Succulents may be pretty, but they're a little picky when it comes to soil requirements. Standard potting soil may work for other house plants but not succulents. These plants are adapted to well-draining, grainy desert soils. Regular potting soil retains water making the soil wet for a long time – succulents' greatest nightmare. The soil being wet for extended periods doesn't just go well with succulents. They're susceptible to root rot, something you wouldn't want to deal with as a beginner. When it comes to which soil to choose, our best bet is a commercial cacti mix. This is available online and you don't even have to break the bank. In case you're feeling a bit creative and you wouldn't mind getting your hands dirty, you can custom make your own cacti mix. Simply mix equal portions of garden soil with perlite, pumice or building sand. Avoid using soil with peat moss as it promotes water retention.



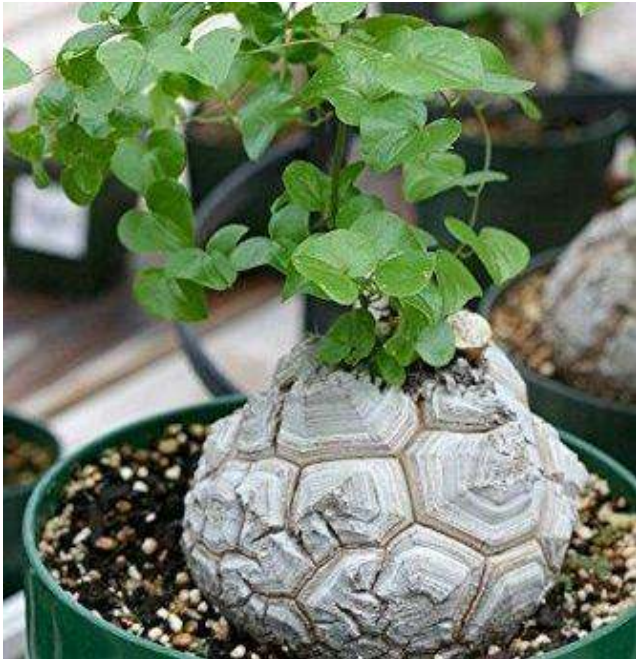
Over Watering Succulents

Loving succulents is okay. However, love them with moderation as they'll easily perish when showered with excess love. Most house plant lovers like their plants looking vibrant and healthy. They try to achieve this by watering their plants every waking minute. Not so with succulents. Remember root rot – it's real. When it comes to watering succulents, the rule of thumb is to allow the soil to dry out completely in between watering. Drench your plants and let the excess water to drain out. Minimize feeding your succulents with water during winter. For most succulents, avoid watering the leaves and only water from below. The reason for this is that one, leaves don't take in water and something else, you're making them susceptible to rot.

Keeping Plants Root Bound for too Long
Most succulents fit perfectly well in small planters. You can even use our hidden cactus mug as a planter for the smaller succulent plants. Nevertheless, plant roots require enough room for growth. If roots overgrow their pot and stay in that condition, desiccation problems will ensue because water won't be absorbed properly. Additionally, uptake of nutrients and minerals may be a problem leading to a weak plant. Succulents are slow growers and determining when to repot may prove to be daunting. The best tip we can think of is repotting as soon as roots start peeping through the drainage hole.

Now that you know the common mistakes beginners make when caring for succulents, you can be sure your succulents are in safe hands. If there are other common mistakes that you've done or you know of, please share them with us below. Like always, happy planting!

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Dioscorea from seed

1. The substrate you need to use for the germination of this plant's seeds is the same one used for Cacti. You can use the Cacti substrate bought in stores, or you can make one yourself. If you decide to mix the substrate on your own, use the following ingredients: 1/3 garden soil, 1/3 sand (with granulation up to 2mm) and 1/3 perlite (you can use smaller pebbles up to 0.2 inches (5mm) or brick pieces, tiles...). The last ingredient is necessary for the mix because it ensures good drainage, which this plant needs because it creates a caudex which can easily rot as a result of prolonged water loitering.

2. You need to sterilize the prepared substrate so that bacteria don't appear. You can sterilize it in various ways. You can flood the substrate with boiling hot water, you can use a fungicide, and you can bake it in an oven for about 45 minutes on 350°F (180°C), or in a microwave oven for 3 minutes. After this step, cool the substrate.

3. The containers you'll use for planting don't need to be too deep. It's enough that the sterilizer is deep about 2 inches (5cm). If the container is as wide as it is deep, you can plant 3 seeds into one container. If you use even wider containers, you can plant more seeds. It is necessary to make holes on the bottom of the container.

3. Pour the substrate into the container, but don't go up to the top, leave at least 0.8 inches (2cm) empty. Water the substrate. You can water it by submerging the container, with a sprayer, pouring the water from the top... I recommend you using rainwater or aged tap water. After watering, tap the soil so it can settle down and leave for the excess water to drain.

4. Before you put the seed into the container, remove the "wings" from the seeds if there are any, because they don't serve any purpose. Make holes in the substrate, deep 0.4 inches (1cm) and put the seeds in there, and bury them. If the seed is not covered with the substrate, it probably won't be able to germinate.

5. Keep the substrate moisturized by covering the container with a see-through foil, plastic bag or glass. You can use bags with a zip opener too. Open the plant every day to ventilate it for 20 minutes.

6. Put the container on an East window, in a room with the temperature of about 68°F (20°C). Slight variations in temperature won't bother the plant. It's best to plant it during Autumn.

7. Germination process will last 2 to 3 weeks for this plant. When most of the seeds germinate, uncover the container and protect the seedlings from direct sunlight. Spray it every day.

8. The seedlings will grow extremely slow during the first year and develop a caudex. The caudex will be around the size of a pea. After the first year, the plant will grow a bit faster and after this period of time passes, you can repot the young plants into separate containers. In about 8 months after the germination, the plant will develop a caudex the size of a coin.



Drosera from seed

1. Drosera usually grows on sour swamp soil, so if you're going to care for it and its growth, you should provide it with at least some similar conditions. You'll find the much needed sour soil in white peat or "sphagnum" peat. Drosera will be able to grow properly in this peat. If you're unable to get a peat like this, you can use another with a higher sourness level, but you need to find one that's completely free of additives. The right substrate to use when planting a plant like this is a mixture of white peat and perlite in 50:50 proportion.

2. Before planting, you need to additionally wash the peat with rainwater or distilled water. This can be easily done by pouring distilled water in a bucket and then adding and mashing the peat in the water. Afterwards take the soaked peat out from the water and let it decant, then move it to another bucket and repeat the whole procedure a couple of times with clean water. This step is important because it stops algae occurrence and bacteria that could completely destroy the seedlings or slow down the growth.

3. Move the wet peat to containers you will use for seeding. You can use any containers you have. They don't have to be deep, it's enough if the container has about 1.20 to 1.60 inches (3-4 cm) peat.

4. The seeds of this plant are extremely small (depending on the kind), so you have to be very careful during the whole planting process. You should plant a larger amount of seeds into one container (for example, in 2×2 inches (5×5 cm) container, you can put up to 30 seeds). Be careful and leave a bit of space between the seeds because if they end up being right next to each other, they can turn out to be stunted. You shouldn't cover the seed with another layer of soil. After you plant the seed, spray the seed and substrate with a sprayer, but make sure that you're using distilled water. It's extremely important that the peat is never let to completely dry off. That's why it's for the best to cover the dish with some kind of a transparent glass, foil, bag or something like that. Put the container with the seed into a shallower container and pour distilled water in it, until the water reaches about 0.4 to 0.8 inches (1-2 cm).

5. The temperature needed for the germination process is between 68 and 77°F degrees (20-25°C degrees). When it comes to light, you need to provide an ample amount of it to the plant, but you need to be careful and NEVER expose the plant to direct sunlight. In order to avoid this problem, you can use artificial light, i.e. put the plant under the light of a lightbulb. If you overheat the seed, it certainly won't germinate.

6. Depending on the type of seed, it will start the germination process after 3 or more weeks. As long as most of the seeds don't germinate, you shouldn't open the container. Afterwards, ventilate it for 10 minutes a day, every day. You should completely open the container when all of the plants in it have at least a couple of leaves. You should protect the container with the seedlings from direct sunlight and maintain the moisture of the peat which shouldn't be let to dry off completely for a few weeks after germination. When the seedlings achieve the diameter of 0.7 inches (2cm) and when the space they're in becomes too small, you can repot them into separate containers.



When should you water your succulents?



Everyone praises succulents as being really easy to care for, so it's kind of embarrassing when one dies on you. Don't worry, you (probably) don't have a brown thumb. There are a few misconceptions about how to care for succulents well. You really only have to straighten out one thing to become a succulent maven – watering.

How often to water succulents?

Here's a little-known secret for succulent care – the amount that you water your succulents isn't nearly as important as how often you water them. It makes sense if you consider why succulents are so sensitive to water. Since most succulents and cacti are native to dry, desert-y conditions, they have adaptations to prevent water loss. That thick waxy sheen on the leaves is called a “cuticle” and it prevents water from evaporating out of the leaves. Succulents even have a special version of photosynthesis (called CAM photosynthesis) where they only open their pores at night to minimize water loss.



These plants are really good at retaining water. So good, in fact, that they can accidentally drown themselves. Plants actually breathe mostly through their roots, believe it or not. If those roots are wet, they can't breathe. Succulent roots have evolved to act like every drop of water might be the last. They cling jealously to all the water they can find in their soil. Unfortunately, being constantly wet leads to root rot – a deadly illness for most plants (and succulents are particularly susceptible).

The number one killer of succulents is overwatering. But not in the sense that they get too much water – rather, they get watered too often. It's absolutely crucial that the soil is given time to dry out between waterings. So how often do you actually water a succulent or cactus? A good rule of thumb is to water once every 10 days. You should still check to be sure that the soil is dry (and has been for a couple days) before you water again.



How much to water succulents?

Now we know when to water our succulents and cacti, but not how much. To figure this out, we go back to the desert these plants came from. It does actually rain in the desert, contrary to common belief. However, that only happens a couple times a year. And in the desert the saying “When it rains, it pours.” is very accurate. The sky just dumps buckets of water. Succulents like to be watered this way too, albeit a bit more often. Forget about the eyedroppers and spray bottles. Put those ‘succers’ under the faucet and drench them. You should water until the water begins to run out of the bottom of the pot. That’s how you know you’ve soaked the soil all the way through. And that part is important – you want to ensure that all of the soil is completely wetted. If you use only a little water, it doesn’t penetrate more than the top couple of inches of soil. That forces the plant to grow roots upwards instead of downwards. That leads to weak roots, poor stability, and an ineffective anchor for the plant. A recipe for disaster.

Proper succulent watering technique

While throwing your plant in the sink is certainly a viable method, you can practice some more applied techniques for an even better effect. We already mentioned that all the soil in the pot needs to be drenched. That’s still true. If possible, though, you should try to avoid getting water on the leaves. This opens the door to a few problems: Mold and mildew can form in the crevices of a plant (like where the leaves meet the stem). It also provides a nice habitat for pests, who generally prefer moist environments. We recommend using a succulent watering bottle with bend watering mouth for easy control during the watering process! We really like this one by Mkono 2. Plants can’t drink through their leaves. That’s what roots are for. Any water on a leaf is being wasted. 3. Occasionally plants, even succulents, suffer from sunburn. When you leave a liquid like water on leaves while the plant is exposed to bright sunlight, there’s a chance that the water will act like a magnifying glass and burn the leaf. So, if you have few enough plants (or just really enjoy watering), you should water each plant individually by pouring water at the base of the stem. Make sure to get the rest of the pot as well.

Avoid overwatering

Water isn’t the only factor in the watering equation, actually. Soil plays a big part. One of the qualities of soil is how much water it retains. Soil mixtures that have a lot of organic matter (stuff like peat moss, coconut coir, etc.) tend to hold a lot of water. Mixtures that mostly have minerals or inorganic matter (such as perlite or sand) don’t absorb water. Succulents and cacti require quick-draining soil. You want the soil to dry out as quickly as possible after it’s watered. Ideally in the same day. That’s why watering in the morning is ideal – it has the whole day to evaporate.



Without proper drainage at the bottom of a pot, water tends to pool and the roots stay wet for longer. That's dangerous. And, no, gravel in the bottom of a pot does not constitute drainage. The water is still there. It doesn't go anywhere. We're not saying you can never put them in those cutesy containers. (By the way, if you're having trouble finding inspiration for planting succulents check out our 12 minimalistic ways to plant succulents). Just know that they might not survive it for very long or be very happy for the duration. So much for that Pinterest photo shoot you had planned, eh?

Tips for succulent watering

So, grab some soil specific to succulents and cacti next time you're out. Your plants will thank you. A quick DIY solution is to just buy a bag of perlite and mix it half and half with any other kind of soil. It's not perfect, but it will dramatically increase drainage. If you do not have any local places to pick up some quick-draining soil, we highly recommend this quick draining soil from Superfly Bonsai on Amazon. Note also that many succulents you buy (especially from big box stores) actually have a poor soil mix when they're sold to you. You'll probably want to repot them as soon as you're able. And speaking of pots – the second most important factor in preventing overwatering is having adequate drainage. That means use pots with a drainage hole. That means that teacups and terrariums aren't optimal containers for succulents and cacti.

Different plants have different needs. Sometimes wildly so. Kalanchoe, for example, are pretty thirsty succulents. They begin to wilt after a week without water. The famous “butt plants”, Lithops, can only be watered three or four times a year or they promptly die. (psst: if you are looking for Lithops Seeds, we recommend these by Micro Landscape Design) Always err on the side of underwatering. Succulents and cacti are literally designed to be thirsty sometimes. They can almost always bounce back from lack of water... but recovering from too much water is a dicey prospect at best. If you have a community pot (a pot with multiple species of plants), water to the lowest common denominator. That means that you should water only when the “driest” plants start to get thirsty. We are following the same advice as above – it's better for succulents to be thirsty for a while rather than overwatering.

Visit www.succulentcity.com for more useful tips. Sharing is caring!



Topdressing: Adenium reacts well to topdressing, but a simple rule is of importance when it comes to these plants: it's better to use topdressing often and less in quantity. That means that when you buy a fertilizer, you should dilute the fertilizer for a half less or even more than it was indicated on the packing. The best option is equal fertilizer, with an equal quantity of macroelements NPK with an addition of micro-elements such as magnesium and calcium. For an example, NPK 10-10-10 would be a good choice. If you don't find something like that, choose the fertilizer with more N and P elements. N is for plant growth and P is for blooming and strengthening the root system.

Wintering: The most often cause of Adenium's death is the result of a combination of cold weather and over-watering. If low temperatures are frequent for your countries during winter nights and there are no high temperatures over the day; you can even decrease watering to once a month. If it's extremely hot and bright where Adenium is, you can water it almost as much as during summer.

Common names include Sabi star, kudu, mock azalea, impala lily and desert rose.



Aeoniums (Greenovias) from seed

1. The best moment to plant Aeonium is in spring because they are accustomed to the Mediterranean climate (not too hot neither too cold). If you are going to plant it in another season of the year make sure that the temperature is warm and there is sunlight. For those who want to sow it during winter (when days are shorter) it is not a problem but you must use strong artificial lights at least 12-13 and preferably 15-16 hours a day.

2. When sowing, is up to you to choose the right pot, you can opt for a seed tray (is necessary to transplant the plants after seedlings), or you can plant it directly in a flowerpot. Avoid clay pots because they dry out so fast, and the Aeonium, dislike the other kind of succulents must have the substrate moist always.

3. The perfect soil should include mix for cactus/succulents but that is not all, it should be a combination of $\frac{1}{2}$ part of cactus mix, $\frac{1}{2}$ part of general soil (also known as potting soil), $\frac{1}{2}$ part of worm compost, and $\frac{1}{2}$ part of peat (you can replace peat for coconut coir). If you can't find the materials mentioned above, another option is to create a substrate mixing cactus mix and peat (equal parts).

4. Once you find the right pot and the substrate is ready, proceed to fill the container with soil and water it. Add plenty of water and leave the container, so that the water has some time to decant. Spread the seeds all over the substrate, do not forget to do it gently. You must not bury the seeds or press them hard, realize a light pressure. Moist them a bit more with a fine spray.

5. Cover the pot with plastic wrap or put it in a plastic bag to keep air humidity. Do not open it until successful germination. If there is enough humidity inside bags there will be no need to open it and water again. If soil is drying out during germination process that means that it isn't watered well or not covered good with zip bag or similar.

6. Maintain temperature of 20°C - 25°C (68°F - 76°F) but during the night it can go down to 15°C (59°F).

7. Do not forget to keep the seed tray or the pot in a light shadowy place during the growing phase, once the seedlings appear, make the seedling get accustomed to the sun, you can do so, putting the pot directly in the sunlight a few minutes daily (increase the time week by week).



8. Once the seedlings are accustomed to the sun is time to transplant (if you planted them in a seed tray). Remove the weak ones, and only transplant the most vigorous and most robust, in this way, you are reducing the risk of attracting diseases or having plants with abnormal leaves and stems.

9. Fill the pot with the substrate, and proceed to plant the seedlings as you like. Once you do that, it is recommendable to add a final layer of compost or worm compost.

10. During this process, some leaves may fall to the ground. Keep calm because it is normal.

Aeonium Care

Watering: as is stated above, the Aeonium plants are from the Canary Islands (Mediterranean climate), a place where the soil is moist. Depending on where you live, you must water them every two or five days. If you are not sure of how many days you have to do it, the best way to know it is sinking your finger in the substrate, if it is dry, they do need water. Keep in mind that the maximum the substrate can dry is a few inches or centimeters (no more than 5 cm). If you do not water them in time, they may die because of a difference of the others succulents, these, do not store a lot of water in their stems, though, everything has a balance if you overwater them, it may cause rotten roots. **Cutting:** like every other succulent, the propagation system is very straightforward. Take a leaf or in the growing season (read above) there are plenty of fallen leaves, so let them dry out for a few days and place them in the pot of your preference. Do not forget to do not bury the seeds, just spread them. After a few weeks, you will notice how the new roots start to appear. Anyways, if you do not wish to do this process, wait when a new leaf falls because it will turn into a new plant. **Temperature:** as mentioned above, the right temperature is the one that is not too hot neither too dry, in other words, a subtropical climate is perfect for these plants. That means that the minimum is 4° C or 40° F, and the maximum is 38° C or 100° F. **Light:** the perfect place to put your Aeonium is where the plant receives direct sunlight (when the sun is not extreme), also having the plant in a light shadowy place is a good option if the sun is very bright, doing this will prevent sunburn in your plants. **Pests and Diseases:** it is affected by a few pests like slugs, to prevent that use an insecticide or fungicide cactus and succulent-friendly. Also, birds may want to take a bite, this is not something to be worried about but if you do not like it, put your plant in a place where birds can't reach.



Aloe from seed

When planting Aloes, it's of extreme importance to provide good substrate drainage. That's why it's good to make a mixture of the following ingredients: garden soil, sand and perlite. You can use coconut peat too at the beginning. It's necessary to sterilize the substrate in a microwave for 3mins or in the oven at 350°F (180°C) for 45 minutes. You can plant Aloes in any kind of container. See-through plastic containers are the most practical, because you can easily see how damp the substrate is at any time. Ceramic containers are not recommended because they keep the moisture around the walls for longer periods of time. It's necessary that the container has numerous holes at the bottom, so that the excess of water can flow easily. Make the substrate and put it in the container, but as you do that be careful not to overfill the container. It's best to leave at least 0.8 inches (2cm) to the top. You can correctly water the substrate during planting like this: the container in which the seed is planted should be sunk in water (it's best to use rain or boiled water).

You should put Aloe seeds on the surface of the prepared substrate, gently pushing them with a straight object. You don't need to cover the seeds with substrate. You can keep the moisture in the container in various ways. You can use nylon and position it with a rubber band to the container; you can use a piece of glass which can be positioned at the edges of the flower pot... The best way to do this is to simply put the container into a plastic bag with a zip opener. Aloe seed is best to plant during the warm months, but you can plant it during winter too, provided that you can supply it with an ample amount of light, warmth and moist. Minimal temperature for Aloe germination is 70°F (21°C). The container with the seed should be put on a bright spot in your apartment, but not exposed to direct sunlight.

Bag with the container should NOT be opened for at least three months. After those three months, you should open the bag every day for half an hour so that the seedlings which germinated can slowly start to get accustomed to the climate which is different from the one it's been in. You should do this for a month, after which the plant will be completely ready to leave the bag. Light plays an important role in lives of your baby Aloes now. Put them on a bright spot, under no circumstances exposed to direct sunlight and spray it from time to time. You may need to repot them only when the plants start running out of space or the container is too shallow.



Aloe Maintenance Place: You need to provide a bright spot for Aloes, but the plant shouldn't be exposed to direct sunlight during the whole day. It's best to find a somewhat shadowy spot. If the plant turns darker or gets brown spots, that means that the sun is too strong. You can grow in the garden during summer, and during winter it needs a bright spot with a temperature of 42 to 53°F (6 to 12°C). **Watering:** Aloes need to be watered somewhat more often, but you should wait for the substrate to dry during two watering processes. Water it less often during winter, approximately 3 times from November to March. You can spray it here and there, but don't overdo it. There's a high probability that the Aloe will wither during winter and look dry, but it will get its good looks when the spring arrives. Too much moist, during either summer or winter is not good because the root rots and the plant can die.

Topdressing: You can apply topdressing to the plant every 14 days during summer with mineral plant fertilizer. You should completely exclude topdressing during winter. **Substrate:** The ideal Aloe substrate is garden soil mixed with a bit of sand, in proportion 2:1. The most important part for it is to provide good water flow, i.e. not to keep water in the pot for too long. In order to manage the best substrate water flow you can, you can add a bit of perlite to the prepared mix, and you can cover the bottom of the pot with gravel. **Repotting:** Aloes are repotted only if the old container becomes too small for them, and you should do it only in spring. During repotting you need to be careful and find a flower pot deep enough and to plant the plant on the same depth it was in the last flower pot. Aloe usually flowers only after three to six years.



Anacampseros from seed

1. Anacampseros succulent is self-pollinating, which means that it doesn't require another plant to make the seed. One blooming plant is enough to create a considerable number of seeds. The seeds of this plant are very tiny and white, with an excellent germination percentage.

2. This succulent thrives in dry conditions, so you're going to need a substrate mixture used for Cacti. You can find the readymade substrate in garden centers or make it on your own. The best mixture contains 50% loam, 40% sand (with granulation up to 0.7 inches (2 mm)) and 10% perlite or some similar ingredient which will boost the substrate's drainage. You don't need to follow the procedure strictly; what matters is that you don't change the granulation because it will affect the development of seedling's roots.

3. The containers you're planning to use don't have to be big. If their depth is about 2 inches (5 cm), they will suffice. You can plant a larger number of seeds in one container, which is desirable because seedlings are slow in growth so you won't have any problems regarding the lack of space. It's necessary to puncture the holes at the bottom of the container, for water drainage.

4. It's necessary to sterilize the planting mixture, as well as the container for planting the seeds. You can do it in several ways. You can bake the substrate in your oven at 360°F (180°C) for about 30 minutes, or in a microwave oven for about 5 minutes. You can sterilize the substrate by pouring boiling water over it. It's important to let the substrate cool down afterwards. It's for the best to sterilize the containers in hot water or wipe them with alcohol wipes, especially if they've been used before.

5. After you've finished the sterilization, pour the substrate into the containers, but leave at least 0.4 inches (1 cm) to the top. Gently push the surface of the substrate with a flat object. Pour fungicide over the substrate in order to prevent mold occurrence.

6. Arrange the seeds on the surface of the substrate so that there's some space between them. Be careful and try to avoid leaving them in one pile, because that will affect the germination process. Gently push them with a firm object and don't cover them with substrate.

7. The substrate shouldn't be let to dry while the germination process lasts. In order to avoid watering it every day, cover the container with the seeds with a piece of glass, a bag or foil. Aside from the optimal moisture of substrate, it's important to provide an ample amount of light for the plant, but don't expose it to direct sunlight.

8. The optimal temperature needed for germination is 72°F (22°C). Most of the seeds will already germinate at a lower temperature or higher for a few degrees, but without big oscillations.



9. If the seed is fresh enough, the germination process starts after 3 days. If you did all the steps correctly, most of the seeds will germinate during the period of two weeks after planting.

10. Leave the container covered for about 3 months, and then start to gradually expose it and get accustomed to exterior conditions. When you notice that the seedlings are strong enough, remove the foil completely. Keep an eye on moderate moisture of the substrate and provide them with an ample amount of light so that they have all the conditions to grow nicely.

11. Seedlings can stay in one container for a long time, you can repot them for the first time when they start lacking space. Be careful not to damage the roots while doing so.

Anacampseros Care

Place: This succulent goes through a period of vegetation during summer, so it needs a lot of light, but don't expose it to direct sunlight. Keep it in shade. During the standstill period in winter, you need to keep the plant on a place at 50°F (10°C) and don't water it. The plant can endure the standstill period at a higher temperature too, up to 65°F (18°C), but it's necessary to provide it with an ample amount of light and water it occasionally.

Repotting You should repot your plants in spring. Choose a container in which the plant won't have too much space. It's enough to leave 0.4 to 0.8 inches (1-2 cm) to the edge of the container.

Watering: The most important thing is to avoid watering the leaves of the plant and that's why it's for the best to water it from below. You can water it abundantly if it's in a substrate with good drainage. Wait for the soil to dry between the watering activities.

Wintering: The plant should spend winter on a cold and light place at a temperature of 41 to 50°F (5-10°C). The wintering period in European conditions lasts from November to March. After the wintering period is over, it's important to gradually wake the plants by exposing them to the warmth and gradually water it more and more as the temperature becomes higher.



Cleistocacti from seed

1. You can sow the seeds in the month of your preference as long as you keep a warm temperature of at least 21° (70°F) in the room where you are going to put the pot or clay pot. Although, it is more than recommendable to sow the Cleistocactus seeds in spring because that is the growing season.

2. As the Cleistocactus are easy to grow, the container you can use can be a seed tray or a pot. When selecting the container that works for you, remember to consider the materials of your substrate, if the substrate does not have perfect drainage consider using a clay pot because they dry out quickly.

3. The soil to use is the same for almost every cactus, and succulents, it has to be porous with perfect drainage. Combine sand, perlite, peat, vermiculite, etc with cactus mix. If you are unable to find the cactus mix, you may use a potting mix. Do not forget to sterilize the soil before sowing

4. Fill the pot with the substrate, water it, and proceed to spread the seeds all over the soil. It is optional that you add a thin layer of the substrate after spreading the seeds. Spray the seeds to give them humidity.

5. Cover the pot with clear plastic, a white paper, a sheet glass, or a plastic bag. Put the container in a light shadow, and some weeks until the seedlings appear. Do not open it until successful germination. If there is enough humidity inside bags there will be no need to open it and water again. If soil is drying out during germination process that means that it isn't watered well or not covered good with zip bag or similar.

6. Maintain temperature of 22°C-25°C (71°F-76°F) but during the night it can go down to 15°C (59°F).

7. Once the seedlings appear, remove the cover of the pot. The seedlings need to meet the sun, to do that you must put them in direct sunlight a few minutes a day. Increase the time when they are growing until they are fully accustomed to the sunlight.

8. Wait three weeks more, and transplant the plants. They will usually resume their growth in three to eight weeks. Do not forget to sterilize the new substrate and to remove the old one from the roots of the plant. If you prefer you can use the rotten hormone to accelerate the process.



Conophytums from seed

1. Sterilize substrate (3+ minutes in microwave or 50 mins in oven- (350°F) and let it cool)

2. Mesembs (Lithops, Conophytums...) require a well draining soil, which means it dries out quickly. Soil should contain a lot of pumice, perlite or sand. Sand should consist of many sizes of particles, from dust to 1/8". The basic soil mix is 1 soil mix to 3 pumice and sand. Remove any big chunks (peat) from the potting soil.

3. Planters should be about 1-1.5 inches deep. Fill a container with good draining soil. Leave 1/2 inches to the top free. Press the substrate, equally.

4. Disperse pebbles granulated up to 0.2 inches

5. Independently of your choice regarding where you are going to plant the seeds the next step is to press the seeds down (do it gently without the need to sink the seeds), some people prefer to use a piece of flat wood or paper to perform the light pressure, then lightly water the seeds.

6. The pot should be moist all the time and must remain closed during the process of germination (one or two weeks), you can cover the container with glass, plastic, or another thing that helps the seeds to keep warm and moist during this phase.

7. The adequate temperature for germination should be not too high, in the day the temperature should be between 15° C (59° F) and 20° C (68° F); when the night falls the temperature should be from 5° C (41° F) to 10° C (50° F).

8. When the process of germination ends the seeds tray should not remain closed, in this way, the plants get accustomed to the air. 9. These plants do not require com

post; however, it won't hurt them if you add the fertilizer when they are growing and after flowering. Remember this is an optional step.

10. During the growth process of the plants, you will be able to observe how some plants are weak and others are not, in this case, to remove the weak plants to give way only to the strongest and robust ones.



Copiapoa from seed

1. The best time to plant Copiapoa plants is in late spring or summer due to the dry temperature. If the place where you live is not dry, you may create the perfect environment through an induced artificial climate.

2. Growing Copiapoa from seeds is a process very hard, so you need a soil rich in nutrients and the most important of everything, a substrate with perfect drainage. Using granite crumbled mixed with very little of potting mix is a good idea, if you do not have granite crumbled, you can opt for another mineral substrate that does not only have the plant, also that dry out very fast.

3. The container where you are going to plant the Copiapoa can be a seed tray or a pot, a recommendation, is to plant Copiapoa directly in the flowerpot because it is a delicate plant. If you choose one, the right is a clay pot due to the ability to dry out everything in a rapid way.

4. Fill the container with soil, moist it and then proceed to put the seeds gently. After spreading the seeds over the substrate, an optional step it to add a thin layer of the substrate, and cover it with a glass sheet, a white paper, or a plastic bag to wrap it up.

5. Put the pot or seed tray in warm windows (allowing the light but having a shadow at the same time); if the sun is hidden or you are in winter, and everything is dark use a heat mat to keep them warm. Keep in mind that the best temperature during this process is 21° C.

6. When the seedlings appear, is time to remove the glass sheet or the plastic bag, and put them in light but avoid direct sunlight.

7. If you planted in a seed tray, or you planted various Copiapoa in a pot, and they are too big, transplant them into new pots to give them enough space.

Watering: Copiapoa plants are not friends of the water, in fact, they are accustomed to living in the driest deserts of the world, and the way they get moist is through the humidity of the air that comes of the sea. In summer the watering should be scarce because at this time is when in the desert there is not rainwater, whereas in winter you may increase a bit the watering due to the beginning of rain in their natural habitat. Keep in mind that every time you water the plant, the substrate must be completely dry before water again. During July and August, it is recommendable that you stop the watering and, in the morning, before the sun goes out, spray the plant with water. If you spray the plant early in the morning, it will simulate the natural environment of the Copiapoa. **Soil:** it's a priority that the predominant material of the substrate is a mineral that helps with the nutrition of the plant and also to dry out the excess of water.

Light: Light: a light shadowy place or direct sunlight (depending on the brightest of the sun) is the ideal. If where you live the sun is very bright as long as there is good air the plant won't have sunburn if this happens to put the place in a light shadow.



Tephrocactus from seed

1. Before start sowing, you need to know that all the species belonging to the Tephrocactus genus are not easy to germinate, and it may take up to four years to see the seedlings. The Tephrocactus seeds have a very low probability of growth due to an inhibitor that covers them.
2. The right container to sow the Tephrocactus is a pot, forget the seed trays because if you are lucky enough and seedlings appear in less than a year, these plants do not like to be moved, though, there are some successful cases of people sowing in seed trays.
3. The soil must have good drainage, and it must be porous. Combine cactus mix with sand, perlite, or another mineral that helps with the porosity. In case you could not find the cactus mix, you may opt for using potting mix. Keep in mind that the mineral must be present in a greater quantity than the cactus mix, for example, 25% cactus mix, and 75% mineral.

4. There are three ways to sow Tephrocactus seeds. The first is filling the pot with soil, sterilize it, moist it and spread the seeds over the substrate, do not bury them. Do not apply an extra layer of mineral. Spray the seeds with water and proceed to cover the pot with a glass sheet, a white paper or a plastic bag (the bag is preferable). Put the container in a window or any other place where there are sun and shadow, in this way the sun can touch the seeds without burning them. Tephrocactus love cool temperatures but, the seeds need a warm environment to grow. In a case where you live in not hot, the best thing you can do is to use a heat mat or lamps. The second method is to use the microwave to break the inhibitor of the seeds. Moist the seeds, and put them in the microwave for two minutes. Make sure you don't burn the seeds. Once you broke the inhibitor, you must do the fourth step.

5. The third method is through the water. In a pot with water, submerge the seeds, and try to wash it off the funicular girdle (the inhibitor). While doing this do not forget to be very careful not to break the kernel. People say that if the seeds are in the bottom of the pot with water, that means they are likely to grow. If you didn't see any results in two months doing the three methods, do not give up. It may take years up to four years to see a seedling so, keep the pot warm and let it be.

Watering: water them only when needed. In the spring, summer, and fall times do the watering only when the soil is dry (it is essential that you allow the substrate to dry before watering again). In winter let the plant alone. The water schedule of this plant should be very poorly. In this case, the saying the less, the more apply correctly. Temperature: this plant can go in hot temperatures as well as frosting times. Just be sure it is not receiving water, and everything will be right. Fertilizer: apply it sporadically, in fact, this is an optional step because this plant is very rustic. The fertilizer must be light, and the adequate quantity for the adult plant should be $\frac{1}{4}$ diluted in a liter of water.



Crassula from seed

1. It's best to plant Crassula in spring or summer because the natural conditions required for the seed germinations and seedling growth are perfect at that time. However, if you can provide these conditions artificially (warmth, light and moist air), then you can plant it during any time of the year.

2. The adequate substrate for Crassula is similar to the Cactus one. This means you can use a readymade mixture you can find at the garden centre. The adequate substrate can be created by mixing garden soil and sand in a 50:50 proportion. In addition to that, you need to enhance permeability by adding pieces of broken bricks, tiles or purchasable perlite. 3. The next step is the sterilization of the substrate in order to avoid fungi occurrence. You need to put the substrate into a microwave oven for 3 minutes at least, or in an oven for at least 45 minutes. Cool the substrate afterwards.

3. Containers for planting Crassula need to be deep around 1.5 inches (4cm). Lay the pebbles at the bottom of the container to enhance drainage. If you previously used these containers for something else, it would be good to disinfect them with hot water or alcohol.

4. Never fill the container up to the top, leave about 0.4-0.8 inches (1-2 cm) of space for the future seedlings. Lightly press the substrate surface with a flat object.

5. Dissolve the fungicide in water according to the package label and water the substrate. It's best to water it by submerging it, but you need to make sure that the excess of the water decants later on.

6. Strew the seeds across the surface and gently tap it. You don't need to cover it with the substrate.

7. Now you need to find the right conditions for germination. It's important that the seed is provided with an ample amount of moisture. Keeping the substrate moist is easily done by using a transparent glass, foil, plastic bag or similar.

8. The optimal temperature for Crassula germination is 70°F (22°C). Day temperature can be as high as 77°F (25°C), and during the night the temperature can be as low as 64°F (18°C). Avoid direct sunlight exposure.

9. Germination usually starts in 5 days, whilst most of the seeds germinate during the period of 3 weeks.

10. The container should be ventilated every day for half an hour, and two months after germination you can completely uncover it. Do it gradually, so that the seedlings can get accustomed to it.

11. The first repotting should be done when you come to the conclusion that the seedlings are strong enough to move and have 3 leaves minimum. The seedlings should be moved with a part of the substrate around the root, to avoid root damage. The seedlings need to be exposed to a medium amount of moisture; the substrate should never be let to dry off completely. It needs an ample amount of light too.



Graptopetalum from seed

1. There are two options at the moment of choosing the ideal flowerpot to sow Graptopetalum you may opt for a seed tray or a pot (preferably one that wide and not long). The adequate soil is the one with good drainage (clay, sand, akadama, pumice, or perlite). Keep in mind that the Graptopetalum grows without much effort and there are many success stories of people sowing directly in pots.

2. Once you choose the pot that you think is the right, proceed to fill with substrate the flowerpot, if the pot or seed tray is not a new one is important that you disinfect it with alcohol or detergent before sowing.

3. When the soil is into the pot, the next step is to plant the seeds. To do this, you must press gently down the seeds, remember you do not need to carve a hole in the ground or bury the seeds to the bottom of the pot. The pressure must be slight, and the seeds must be at the surface of the soil. It is important to note that these seeds are small if you do not feel comfortable pressing gently the seeds you can always use a wet toothpick, and it will do the job correctly.

4. Add little water do not forget these plants are delicate regarding water, do not exceed and limit the watering to one time every one or two weeks in summer. When the growing process is, it's best to keep the plants with shadow and natural light. Do not forget to cover with a plastic wrap during this phase, to allow the air to pierce the plastic wrap. Do not put the pot with direct contact with the sun during this phase because it may result in a failed germination. When the seedlings appear, you can remove the plastic wrap, and you should gradually expose the seedlings to the sun.

Watering: the Graptopetalum are perennial succulents from Mexico, that require water in summer due to high temperatures, watering once a week in summer is more than sufficient. When winter arrives the watering frequency, decreases to a minimum level (if the plant is on the ground, there is no need to water). Like any other succulent, the excess of water can damage the plant resulting in rotten roots. Sometimes when the Graptopetalum is in the ground, you can't avoid the excess of water, in this case, remove the plant with the rotten roots and replace it. When you water, avoid watering the leaves because they have a waxy coating that protects them from the sun. The best way to know when to water is to touch the soil a few centimeters or inches below if it is dry to your plants.



Haworthias from seed

1. Substrate for planting seeds of this plants should contain one part crushed peat, one-part river sand and one part pebbles with granulation about 0.10 inches (3mm); or something similar which will provide better drainage, for example, broken brick or tile, perlite, ceramic pieces... Mix those ingredients in equal amounts.
2. Sterilize the substrate in an oven for about 45 minutes at 350°F (180°C) or in a microwave oven for 3 minutes. You can treat the substrate with a fungicide too, but if you sterilized it, it's not necessary. The substrate is sterilized in order to avoid fungus occurrence, which can completely destroy the seed or seedlings.
3. The container you use for planting shouldn't be deep. It's enough to use 0.8 inches (2cm) of the substrate because it doesn't develop a big root until a full year passes. The container has to have holes on the bottom so that the excess water can drain out. It's good to disperse pebbles too, in order to ensure better drainage.

4. When you fill the container with the substrate, gently tap it in order to make the surface even. Water the substrate by submerging the container into another dish with water. When the surface of the substrate starts shining, that means that the substrate is soaked enough. Take out the container and leave for the excess water to drain out.
5. Put the seeds onto a moist substrate and tap them once again gently with a flat object, so that the seeds can stick to the substrate and not stay in the air. Covering the seeds with an additional layer of the substrate isn't necessary if the seeds are tiny. The bigger seeds can be covered with a thin layer, just so you don't see them. Be careful not to bury them too deep, because that way, they take more time to come out to the surface. If you cover the seeds with the substrate, you need to dampen the top layer too.
6. You can do this in another way. Pour the substrate into the planting container, use a flat object to flatten the soil out, arrange the seeds, tap them into the substrate and use a water pump to dampen them. I recommend using distilled water or rainwater.
7. Keep the moisture by covering the container with a piece of foil, piece of glass or plastic. It's important that it's see-through.
8. Put the container somewhere in the shadow. Early in the morning or late during the night spray the substrate.
9. For germination of this seed, you need to provide oscillations in day and night temperatures. Keep them at about 77°F (25°C) during the day, and let the temperature fall under 68°F (20°C) during the night. It's necessary to do this for some types in order to achieve germination.
10. Germination usually starts in 5-15 days (depending on the type). When the first seed germinates, remove the glass/foil, but keep spraying the substrate early in the morning and at night until the majority of seeds germinate.
11. After the germination process, most of the seeds need to be in a shadowy place for about 3 more months. You can expose it to stronger light afterwards.
12. There can be a slight problem of seedlings rolling over at the beginning. In that case, it's obligatory to gently lift them and dig in a bit, but not too much. This is best done with tweezers.



Pachyphytums from seed

1. Like any other succulent plant, the soil must have good drainage and must be porous because, in this way, the roots of the plant can expand without any problem. There are different ways to prepare the adequate substrate for Pachyphytum plants. The most common is using a combination of a substrate for succulents and perlite or sand.

2. When choosing the right container to sow the Pachyphytum seeds, you have two options, to opt for a seed tray or sowing in a small pot, then transplant. Whatever you choose, you will need a plastic wrap, a glass, a paper, or something that serve as a cover for the pot.

3. Once you choose the container of your preference, proceed to fill it with the substrate and Add plenty of water and leave the container, so that the water has some time to decant.

4. The Pachyphytum seeds are quite small it is understandable that maybe, you do not want to touch them with your hands, in this case, you can use a white paper or something flat that allows you to spread the seeds over the soil. Then, with the tool you chose, gently press the seeds on the substrate. If you proceed to this process with your hands, be careful, and do not mash them or let them slip from your hands to the floor.

5. Cover the pot with plastic wrap or put it in a plastic bag to keep air humidity. Do not open it until successful germination. If there is enough humidity inside bags there will be no need to open it and water again. If soil is drying out during germination process that means that it isn't watered well or not covered good with zip bag or similar.

6. Maintain temperature of 18°C-21°C (65°F-70°F) but during the night it can go down to 15°C (59°F).

7. Once the seedlings are visible, and you remove the cover, you have to little by little let the seedlings get accustomed to the sunlight.

8. Pachyphytum plants love the sun (when they are already plants and not seedlings), they can support direct sunlight, but there are occasions when the sun is quite intense that the plants need to be in a small shade. Despite the fact, these plants are sun lovers they can also support a shadowy place, though, this may lead to foliage less bright, and flowers may differ from the plants that grew with sunlight. The perfect temperature in winter for these plants should not exceed 5° C (41° F), for summer the maximum temperature is 35° C (95° F). When winter comes you should keep the substrate as dry as possible, in this way, they can withstand the cold.

9. During the growing phase, it is recommendable to use fertilizer once a month. The cacti fertilizer works well with Pachyphytum seeds. However, you can use one of your preference.

10. Finally, when the plants are ready to transplant do not forget to remove the weak ones, only transplant the most robust and biggest. Keep in mind that weak plants are prone to contract more diseases so, it is not a good idea to maintain them.



Pachypodiums from seed

Before planting Pachypodium, you need to soak the seeds in the water with a temperature of 86°F (30°C). Keep them in water for about 3 hours. The best indicator that the seeds are ready for planting is when most of the seeds sink to the bottom. It's desirable that the water you soak the seeds in is not chlorinated. Substrate for germination needs to contain Cactus soil, sand and pebbles (perlite or pieces of brick). Sterilize all the ingredients in a microwave for 3 minutes or in the oven for about 45 minutes on 350°F (180°C). Cool the substrate. You can use fungicide for the sterilization too. Containers for planting should be deep about 2 inches (5cm). It's important never to fill them to top, but leave free space of at least half an inch (1 cm). In one container, 2×2 inches (4x4cm) there can be 8 seeds. Spread a layer of pebbles over the bottom of the container, because it will facilitate the drainage of water surplus.

Then pour a layer of Cactus soil, and spray it with a sprayer (you need to see the water coming out of the bottom of the container). Afterwards, add a layer of sand and water it again. You can lay the seed over this layer, it's just important that it's put horizontally. You will cover the seed with another thin layer of sand, 0.12-0.20 inches (3-5mm). And then water the sand with a sprayer again. Cover the container with a transparent foil, bag, glass or something similar, so that the moisture will stay in this container, which is extremely important for germination. Pick a spot with temperature of 65-75°F (20 i 25°C), well-lit, but don't expose your plant to direct sunlight. Germination can start as soon as 5 days after planting, but that can take more time to happen. When most part of the seeds germinates, remove the foil with which you kept the plant moisturized. Maintain the substrate moist for seedlings and keep them away from direct sunlight for a couple of months. Young plants will grow relatively fast. When they reach the height of about 1 inch (3cm), you can repot them into individual pots making them the same soil combination you did for planting.

Place: Mature Pachypodium can endure strong, summer sunshine. However, you need to gradually adjust it to it so it doesn't get burned and starts shedding leaves. You need to find a well-lit spot in the garden or terrace for it, and during winter it needs to be in the house.

Substrate: This plant grows on a poor, sandy soil in nature, so you need to provide it with similar conditions. The best mixture is the one you can find in a Cactus mix, with an addition of another layer of sand on the surface. In order to improve the substrate drainage, add some perlite or pebbles or something else. The root of this plant doesn't stand to be wet for a longer period of time, so it's necessary to make sure that the water flow through the substrate easily



Sedums from seed

1. The best months to sow Sedum seed are from March to April (spring) or from June to August (summer-late summer). If you plant the seeds in spring, the adequate temperature should be more than 15-18° C (60-65° F). In winter the minimum temperature required is 10° C (50° F).
2. You can choose the container of your preference, a seed tray or a pot are good options.
3. The soil must be one with good drainage, combine cactus mix with sand or perlite, and you will have the perfect substrate. If you do not find the cactus mix, another option is to use potting mix in a low quantity. Before filling the pot with the substrate, you must sterilize it.

4. Fill the pot with the substrate and moist the soil. The Sedum seeds are quite small so, it is recommendable that you use a white paper or another tool that helps you see the seeds. Spread the seeds over the soil, so not bury them. Add a thin layer of vermiculite (do not abuse). Slightly spray the seeds with water.

5. Cover the pot with a glass sheet, a white paper, or a plastic bag during the germination process. Seeds need light so, keep them in a light shadow like a windowsill. The seedling will appear in fourteen or twenty-one days.

6. When the seedlings appear, remove the cover to allow air circulation. You must put them in direct sunlight (do it gradually), begin with a few minutes a day and then, increase the amount of time they are in direct contact with the sun. When seedlings are accustomed to the sun, move them from their current location.

7. If you sowed in a seed tray, once the seedlings have six or eight weeks transplant them in new pots, do not forget to sterilize both the soil and the garden tools.

Watering: Sedums are succulents so only water them when they need it. The best way to know when to water the plants is craving your finger in the soil if it is dry, you should water but keep in mind that you must allow the soil to dry before new irrigation. Many people like to water well the plants during their first year, and then when they are mature, the watering is restringed. **Light:** they do well in direct sunlight as long as they have enough air circulation if where you live the sun is not bright enough to make sure that it has light and no rain.



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succs.n.pups My discorea elephantipes, aka Turtle Back, seedlings are doing so well! they took about 2-3 weeks to pop up and are about 2 months old right now. Can't wait to watch them keep growing! Seeds were from



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