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Agriculture and Natural Resources

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Garden Notes

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SUCCULENTS

Succulents demand little but give a lot and are so much fun. They thrive in our growing area with proper care and are quite forgiving. Their shapes, textures, sizes and colors are diverse and many have beautiful blooms from tiny to large. The majority are non-invasive. Nearly all do well in pots, making them portable and great for small patios, decks and apartments. What a great combo! Not all have the same growing requirements, so you must do your research.

Some Interesting Facts

Cacti are succulents but not all succulents are cacti.

They can be found on every continent but Antartica.

There are over 10,000 species worldwide with 2,000 considered cacti.

Some have natural sun protection.

Some disguise themselves, such as lithops that look like stone.

Some can survive freezing temperatures.

Some are edible by wildlife and humans. The Portulacaria afka 'Elephant Bush' is 80% of the elephant's diet in the wild.

Poinsettias are succulents.

Cactus spines are modified leaves that protect the plant from predators, provide shade and conserve water.

There are four categories of succulents - stem, root, leaf, caudiciform. Leaf succulents comprise the largest category and vary widely in form. Some have no stems like the well-known Sempervivum "hen and chicks". Caudex succulents store water in their trunks, like the Ponytail Palm and Pachypodium.

Caring for Succulents

Light

Generally, they do best in bright light, but it depends on the species. Most need protection from the Sacramento Valley scorching summer sun. Some can take full sun which is 4-6 hours a day.
Provide shade in the hottest part of the day to prevent sunburn and heat stress.

Soil

Use well-draining potting mix, such as cactus/succulent mix. Add pumice to enhance drainage - 50% potting mix with 50% pumice is a good mix. Pumice doesn't decompose easily or float to the top like perlite. Pumice comes in different sizes. Experiment with the mix you like best. Pumice is readily available at local garden centers and on the internet.

Pots

Using terracotta pots helps absorb excess water and helps prevent overwatering. However, they are expensive, break easily and can be heavy. Ceramic pots are decorative, heavy and less porous. Plastic is lightweight, inexpensive but not breathable so be cautious not to overwater. One or more drainage holes is a must.

Repotting
When the plant has outgrown its pot, it is root bound or if soil is no longer draining properly, it's time to repot. Do this during the active growing season of the plant (refer to Dormancy Table). Don't repot when the plant is flowering.

Water
Succulents drink responsibly by storing water in their leaves and stems. They hate wet feet. Water deeply but infrequently and let the soil dry out before watering again. You can use a moisture meter, your finger or a wooden skewer to test moisture. (There are videos on YouTube on using a wooden skewer.) They also like rain water. This water provides dissolved minerals plus dilutes and flushes out salts and chemicals that have built up in the soil from tap water.

Water pH
Succulents like slightly acidic water. A 5-6.5 pH is ideal. Generally urban and residential water tend to be alkaline, which is a pH higher than 7, meaning it is neutral. (Additional information is available at: waterresources.saccounty.gov) To acidify the water, add 1 T vinegar per gallon of water. For a gentler alternative use a fine grain citric acid (1/2 tsp citric acid = 2 T vinegar).

Dormancy & Water
Succulents are either summer or winter dormant (see table). This is the time when plant growth either stops or slows down. Summer dormant plants need watering during their dormant period but do not overwater. Winter dormant plants generally don't need water during dormancy because their roots don't absorb moisture. Dormancy can last weeks or months depending on the variety so research your plant variety. Plants may stop growing or lose leaves and look like they are dying but this is normal.

Fertilizer
Succulents are able to withstand neglect and tend to care for themselves. Most experts say fertilizing is not necessary. However, if your plant looks a bit hungry or is in older soil, feed with a low nitrogen fertilizer (10-30-20). Liquid water-soluble fertilizers are good and should be used at half strength. This should only be done during the plant's growth period (refer to Dormancy Table). Never fertilize a newly transplanted or acquired plant.

Pests
Inspect often for scales, aphids, spider mites and mealybugs. These pests hide in all the crevices and can take over quickly. A hand lens will assist with identification. If pests are found, spray with 70% isopropyl alcohol. It evaporates quickly. Using oil-based sprays on most succulents' wicks away the farina, the waxy white coating.

Frost Protection
When moisture in plant cells freeze, the cells expand and burst, leaving mushy leaves. In light frost, leaves may show damage to their tips. In a hard freeze for several hours, the entire plant can collapse. Crassulas, Aeoniums, Euphorbias and Kalanchoes are most tender and need protection. Cover with frost cloth when freeze or frost is predicted or put under a covered porch. Frost cloth is best because you can leave it on for days, unlike using fabric which must be removed daily. Never use plastic. Sempervivums, yuccas, agaves and some cacti are cold hardy.

Propagation
You can propagate from leaf or stem cuttings. Allow the cuttings to callus for a few days before planting in your succulent/cactus soil mix. Keep them moist but not wet until roots form. Keep out of the sun until roots are formed.

Toxicity
As with all plants, some succulents are toxic. If you have a "chewer", pets or humans, do your research.

Label
Label your plants. There are a variety of labels available at your local nursery and on the internet. It is a challenge to remember every plant name!

Succulent Dormancy Table

Dormancy in the Northern Hemisphere plants is caused by chemical changes within plant cells. It is stimulated by cool temperatures and shorter days in late summer and fall. This "binds" water so it cannot freeze and injure plant cells. To break dormancy, plants must first go through a period of cold (about 40˚F or colder) for an average of 63 days. This cold period triggers changes which, when warm weather appears allows plants to "deharden" and resume growth. Source: James Feucht, PhD, 2005 Colorado State University Cooperative Extension

Winter Dormant, Summer Growers (repot in March)
This group has adapted to our northern hemisphere cycle and are dormant from November through February. Many of these will also enter a pseudo rest period for a few weeks during the hottest part of the summer before putting on a final burst of growth in September and October.

Adenia	Cissus	Fockea	Operculicarya	Siningia
Adenium	Cyhostemma	Hernia	Pachypodium	Stapelianthus
Agave	Didieria	Ibervillea	Pedilanthus	Synadenium
Alluadia	Dorstenia	Ipomoea	Plumeria	Tillandsia
Brachystelma	Echeveria	Jathropha	Pseudolithos	Trichecaulon
Bursera	Encephalartos	Lithops	Pterodiscue	Trichodiandema
Calibanus	Euphorbia	Monadenium	Raphionacme	Xerosicyos
Ceropegia	Ficus	Moringa	Sempervivum	

Summer Dormant, Winter Growers (repot in August)
This group is dormant during warmer months of May through August. Their primary growth occurs during autumn and spring while slowing considerably during true winter. Many will exhibit marginal growth during the summer months especially in the Lilly and Crassulaceae families. These plants prefer no or little summer water.

Adromischus	Ceraria	Gibbaeum	Pachycormus	Sedeveria
Aeonium	Conophytum	Graptopetalum	Pachyphytum	Sedum
Aloe	Cotyledon	Graptoveria	Pachyveria	Senecio
Anacampseros	Crassula	Haemanthus	Pelergonium	Stomatium
Astroloba	Dioscorea	Haworthia	Peperomia	Solcorebutia rauschii
Avonia	Dudleya	Kalanchoe	Portulacaria	Talinum
Bowiea	Fouqueria	Neohenricia	Sansevieria	Tylecodon
Bulbine	Gasteria	Othonna	Sarcocaulon	

Making Changes - Timing
When to repot, prune excess growth, take cuttings or physically disturb your plants is closely related to dormancy. Succulents differ from many other types of plants when making changes. You do not want to disturb them when they are resting. Rare, slow growing species are particularly sensitive, and drastic changes can be fatal.

When repotting, wait until you see signs of new growth. Shaping or trimming back excess growth is best done before the growth period. For summer growers this would be March and for winter growers, it would be August. Fast growing species can usually be reported or pruned at any time.

Full Sun Succulents

Agave, Aeonium. Summer dormant.
Aloe - larger species.
Cotyledon tomatosa, Bear's Paw. Also grows in shade.
Crassula, Jade Plant. Also grows in shade.
Sedum morganianum, Donkey's Tail. Also grows in indirect light.
Euphorbia tiracalli, Firestick
Faucaria, Tiger Jaws
Graptopetalum, Ghost Plant
Pachyphytum
Sedum, Stonecrop
Senecio, Blue Chalk Sticks
Sempervivum, Hen & Chicks
Yucca

Low Light Succulents

Agave attenuate, Foxtail agave
Aloe - smaller species
Curio rowleyanus, String of Pearls
Echevaria
Kalanchoe
Kalanchoe tomemtosa, Panda Plant
Hoya, Wax Plant
Senecio, String Bananas, String or Pearls, String of Dolphins

Plant types best suited for Sacramento region

Agave
Aloe species (not hybrids): ferox, pubescent, wickensii, pillansii
Crassulaceae: *Echevaria, Sempervivum Sedum, Crassula*
Euphorbia: desmondia, ferox, horrida, globosa, pillansi, polygona, stellaspina
Mesmbryantheums: Cheroidopsis, Delosperma

Additional Information

- UC Master Gardeners of Sacramento County: sacmg.ucanr.edu, 916-876-5338
- Fair Oaks Horticulture Center, Fair Oaks, CA workshop and location information: ucanr.edu/workshops
- The Complete Book of Cacti and Succulents, Terry Hewitt
- Succulents Simplified, Growing, Designing, and Crafting, Debra Lee Baldwin
- Succulent Obsession, A Complete Guide, Ken Shelf
- Hardy Succulents, Tough Plants for Every Climate, Gwen Moore Kelaidis
- Succulents: The Ultimate Guide to Choosing, Designing, and Growing 200 Easy Care Plants, Robin Stockwell

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