



Horticultural Tips: Growing Succulents Indoors

by Richard Jauron, Extension Horticulturist, Iowa State University

Succulents are plants that possess thick, fleshy leaves or stems. These modifications serve as water storage organs to ensure the plant's survival in semi-arid to arid environments. Succulents include cacti and plants from several other plant families. Succulents vary in size, shape, texture, growth habit, and other characteristics.

In Iowa, commonly grown succulents in outdoor perennial gardens include sedums (*Sedum* species) and hens and chicks (*Sempervivum* species). The jade plant (*Crassula argentea*), snake plant (*Sansevieria trifasciata*), ponytail palm (*Beaucarnea recurvata*), burro's tail (*Sedum morganianum*), century plant (*Agave americana*), and Christmas cactus (*Schlumbergera bridgesii*) are a few of the many succulents grown as houseplants.

While succulents vary from odd to beautiful, many make excellent houseplants for beginning and expert gardeners. Succulents do not require a great deal of care and perform well in the average home. Some of the key aspects of their care are given below.

Light

Most succulents perform best when placed in a bright, sunny window. A sunny south or west window is best. In rooms with insufficient light, place succulents under artificial lighting. A fluorescent light fixture containing one cool white and one warm white

tube provides adequate light for succulents and other houseplants. Position the fixture 6 to 12 inches above the plants and keep them lit for 12 to 16 hours daily.

Watering

Succulents do not need to be watered as often as most other houseplants. When watering succulents, you should water them thoroughly so that water freely flows out the drainage holes in the bottom of the container. Discard the excess water. After watering, the potting mix should be allowed to dry out completely before the succulents are watered again. The frequency of watering is determined by the plant



Jade plants. Photo by Cynthia Haynes, ISU Horticulture.

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Snake plants. Image by Cynthia Haynes, ISU Horticulture.

species, composition of the potting mix, environmental conditions indoors, and time of year. A general rule is to water succulents more frequently in spring and summer than in winter.

Fertilization

Most succulents do not require heavy fertilization. Succulents can be fertilized once or twice a month when the plants are actively growing (spring and summer months). A dilute solution of a soluble houseplant fertilizer works fine. Prepare the solution by dissolving one-half to one-third of the label recommended amount in a gallon of water. Succulents require little or no fertilization during the winter months.

Insect and Disease Pests

Succulents have few insect and disease problems. Mealybugs, scales, and spider mites are occasional pests. If the plants are lightly infested, mealybugs and scales can be controlled by dabbing them with cotton swabs soaked in rubbing alcohol. Spider mites can be controlled by spraying the plants with insecticidal soap. Other insecticides that can be used against mealybugs, scales, or spider mites include the active ingredients pyrethrin, resmethrin, and azadiractin.

Root and stem rots are the most common problem seen when growing succulents. Rots are associated with overwatering or poorly drained potting mixes. To avoid this problem, be sure to allow the potting soil to dry completely before watering. When repotting succulents, use a potting mix formulated for succulents or add coarse sand (1 part) to a standard potting mix (2 parts).

Interior Pests: Centipedes and Millipedes

by Laura C. Jesse, Extension Associate in Entomology, Iowa State University

Centipedes live in moist, protected places. Outdoors they are usually found under stones, rotted logs, leaves, and bark. Most centipedes are predators of other small arthropods. The house centipede, *Scutigera coleoptrata*, is capable of living and reproducing in buildings. The body is brown to grayish yellow and has three dark stripes on top. The house centipede is about 1 1/2 inches long and has very long slender legs. The house centipede is active at night and feeds primarily on small insects such as cockroaches and other arthropods. Although centipedes are beneficial because they eat other insects, most people don't like seeing them running across the floor.

Millipedes can be distinguished from centipedes by the position and number of their legs. Millipede legs are underneath the body, whereas centipede legs stick out along the sides of their bodies. Millipedes have two pairs of legs per body segment, while centipedes only have one pair per segment. Outdoors millipedes also are found in damp areas such as under leaves, mulch, plant debris, or in cracks and crevices. Because they cannot reproduce

indoors, millipedes found inside wandered in by mistake. Millipedes feed on damp and decaying vegetable matter and are beneficial because they are decomposers. However, they become a pest when they wander into buildings. Millipedes also migrate long distances during certain times of the year (varies with the weather, but commonly in spring or fall) and will occasionally enter structures in large numbers during these migrations.

Management of centipedes and millipedes needs to focus on reducing the number entering the school. First, seal cracks, gaps, and other points of entry around windows, doors, and the foundation. Second, try to



A house centipede. Photo by Katina Fagnand, Torrington, CT.



A millipede. Photo by David R. Martin, Berkeley, CA.

maintain a reduced moisture perimeter of three feet around the foundation. This can be accomplished by raking back bark mulch from the foundation, keeping plantings trimmed to allow sunlight to dry the soil, and letting soil dry between watering.

Perimeter spraying with insecticides is of limited benefit in controlling centipedes and millipedes because the products do not always reach

their protected habitats and because millipedes can migrate long distances. Additionally, these sprays will kill non-target organisms.

When centipedes and millipedes get indoors it is best to remove them with a vacuum or broom. Sticky traps can be placed against walls near entryways. Eliminating suitable habitats (boxes, newspapers, and other clutter) and reducing moisture (ventilation or dehumidifiers) also will help in managing these occasional invaders in the school.

Indoor use of insecticides is not recommended for controlling millipedes because they usually die in a short time because of the dryness. Neither is insecticide use recommended for controlling centipedes. Removal of their food source is a more practical solution.

Teacher Note: Using Demonstration Gardens to Study Insects

by Bethzayda Matos-Carrion, George Washington Carver Doctoral Fellow in Entomology and Horticulture, Iowa State University

Gardens on school property allow students to learn about soils, plants, animals, and their interaction, as well as provide aesthetic benefits. In a recent survey of elementary children, bird and butterfly gardens were ranked 1st as a favorite place to play or visit on school grounds.

The colorful displays of a school garden are an excellent place to observe the pollination process. Flowering followed by pollination must happen for plants to produce seeds. Seeds are the primary method of survival and dispersal for most plant species. Additionally pollination is necessary for proper development of many fruits and vegetables.

Pollination is the transfer of pollen from the anthers (male part of flowers) to the stigma (female part of flowers). The pollen grain moves down the style and arrives at the ovary where the eggs are located. The pollen grain then fertilizes the eggs. Successful pollination ultimately results in seed production.

Plants have different ways of making this process happen. Some plants such as corn, grape, beans, tomato, eggplant, and pepper have both the female and male flower parts close together. Wind serves as the pollinating agent for these plants. For other plants the pollen must be moved by pollinators. Pollinators are the organisms that carry the pollen from the male to the female flower parts. Examples of plants requiring a pollinator include apples, melons, squash, strawberry, and sweet cherries.

Insects such as honey bees, bumblebees, flower beetles, hover flies, and butterflies can serve as pollinators. These insects are not purposely doing a favor to the flowers. They are enticed to do the job with a food reward: nectar (sugar and water) and pollen (protein). All the members of a honey beehive get nourishment from the pollen and nectar brought in by the worker bees. In some cases, hummingbirds can serve as pollinators.

Pollinators are attracted to your garden by flower color, fragrances, and shapes. During the daytime, flowers with bright colors (blue, yellow, red, and violet) are the most often visited. At dawn and dusk, odors are more important for attracting



*This bee, *Osmia ribifloris*, is an effective pollinator. Shown here on a barberry flower. Photo by Jack Dylinga, USDA-ARS.*

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Example of a garden in bloom. Photo by Keith Weller, USDA ARS.

pollinators. The structure of some flowers actually directs the pollinator toward the nectar. Once the pollinator flies or crawls into these flowers, its mouthparts, body hairs, antennae, and legs collect pollen, which is then dispersed to the next flower visited.

The mouthparts of butterflies, moths, and bees allow these insects to reach nectar pools without difficulty. Other insects such as beetles and ants have short mouthparts and must crawl completely inside a

flower to reach the nectaries. Thus the shape of the flower and the type of mouthpart of the pollinator is an important consideration in studying pollination.

Plant species selection when starting a demonstration garden is very important as it relates to studying pollinators. Extending the blooming periods of the garden throughout the growing season will attract pollinators to your garden for a longer time. Bumblebees are attracted to the same color and shape of flowers that have provided a food source before. They will keep coming for more food later if their trip was productive.

The following tips can help you preserve, protect, and attract pollinators to demonstration gardens on school properties:

- Diversify in your garden for plants that have different colors, fragrances, and shapes throughout the growing season.
- Limit insecticide use to least disruptive products.
- When insecticides are necessary, time applications to when most pollinators are not active (for example, late evening or after dark).
- Do not spray plants that are blooming or when it is windy.

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