

Guide to Growing Houseplants

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Proper care can extend the lives of houseplants. This NebGuide offers hints on caring for houseplants, including conditioning, light, and fertilizing.

Caring for houseplants offers opportunities for people who like to work with living things and watch them develop. Today, houseplants are an integral part of indoor decor throughout the year.

An artificial indoor environment often hinders plant development. High temperatures, low humidity, lack of sunlight, poor soil conditions, and improper watering often contribute to most houseplant problems. Occasionally, insects or plant diseases damage houseplants.

Many houseplants may eventually become unattractive or too large for the home. Before discarding these plants, use them for cuttings or divisions for new plants. However, proper care can extend their lives.

Conditioning

Your home usually has a lower light intensity and lower humidity than the plant experienced before purchase. As a result, houseplants may lose some of their foliage within a week or two of purchase. Conditioning plants to the home environment extends their useful life, so purchase preconditioned plants whenever possible. These plants are found at retail centers, growing in lower light and humidity levels typical to home growing conditions.

Condition Newly Obtained Plants

First, expose your plants to the maximum amount of available indoor light. This is usually a site close to a south window. Second, over a period of four weeks, reduce the available light to the intensity of the location selected for the plant. Third, leach the growing media by allowing water to filter down through the soil and escape through the drainage hole. Allow the growing media to dry before leaching again. Repeat this leaching process four or five times. This removes excess fertilizer or salts that can cause leaf drop when light intensities are low.

Avoid moisture stress by maintaining the correct relative humidity in the home and the correct soil moisture content. Greenhouses are more humid than most living areas. While you cannot duplicate that environment in your home, using a humidifier benefits both you and your plants.

Light

Homes vary in the amount of light available for plant growth. Generally, the brightest location in any home is near a south window, while the darkest is across the room at a north wall. About the same amount of light is received by a houseplant located by an east or west window. However, plants with a western exposure are exposed to a much higher temperature.

Seasonal variations in light intensity occur within a home. Plants located in an east window during the summer may require a south exposure in winter.

Since most homes provide less than adequate light for many plants, consider selecting plants requiring medium to low light unless supplementary light can be provided (*Tables I-III*). Plants such as Chinese evergreen, cast iron plant, philodendrons, Boston fern, and *Sansevieria* tolerate very low light intensities. When plants are located in low-light areas (less than the 75-foot candles that are necessary for reading), use the minimum recommended day-night temperature found on the information tag on each houseplant.

Light usually strikes the plant from only one side. Rotate the plant to maintain an upright growth habit. Symptoms of insufficient light include small leaves; long, thin stems; and a lighter than normal color. Where light is limited for plant growth or desired quality, supplement the natural light with fluorescent lamps. Plants that struggle to exist indoors will thrive with 12 to 16 hours of supplemental light daily.

Some houseplants can be placed outside in summer. Plants often are revitalized by this treatment. However, to avoid sun scorch, condition your plants to the higher outdoor light intensities. Do this by initially placing the plant in the shade and then, over a four or five week period, gradually expose the plant to increased light intensity.

Table I. Plants that will grow in low, indirect light, from sunlight filtered through a curtain to shadowless light from a north window. Locate more than 8 feet from windows; no direct light.

Common Name	Scientific Name
Chinese evergreen	<i>Aglaonema commutatum</i>
Chinese evergreen	<i>Aglaonema simplex</i>
Birds-nest fern	<i>Asplenium nidus</i>
Cast-iron plant	<i>Aspidistra elatior</i>
Parlor palm	<i>Chamaedora elegans</i>
Corn plant	<i>Dracaena fragrans</i> 'Massangeana'
Heart-leaf philodendron	<i>Philodendron scandens</i> subsp. <i>oxycardium</i>
Snake plant	<i>Sansevieria trifasciata</i> 'Laurentii'
Birdsnest sansevieria	<i>Sansevieria trifasciata</i> 'Hahnii'
Pothos	<i>Epipremnum aureum</i>

Table II. Plants requiring more than four hours of direct sun or bright, indirect light. Locations include brightly lit offices and areas with 4 feet of large windows facing south, east, or west.

Common Name	Scientific Name
Croton	<i>Codiaeum variegatum</i>
Coffee	<i>Coffea arabica</i>
Jade plant	<i>Crassula argentea</i>
Wax plant	<i>Hoya carnosia</i>
Shrimp plant	<i>Justicia brandegeana</i>
Sea teak	<i>Podocarpus macrophylla</i> 'Maki'
African violet	<i>Saintpaulia ionantha</i>
Christmas cactus	<i>Schlumbergera bridgesii</i>

Temperature

Plants vary in their temperature requirements. Most foliage houseplants tolerate day temperatures between 65 and 75°F. Night temperatures should be 10 to 15°F cooler than daytime temperatures.

On very sunny days, day temperatures can be 10°F higher than normal, while on cloudy days they will be lower. Generally, as temperature increases, the requirement for light increases. In most homes, plants will be healthier if day temperatures are in the low 70s rather than the 80s.

Reduce temperature swings inside the home. During the winter, remove plants from window ledges to reduce exposure to freezing temperatures. Be very careful with foliage plants such as African violet, croton, and prayer plants, which prefer warm night temperatures.

Plants grown at warmer temperatures than recommended often are weak and have spindly growth. Plants grown at temperatures too low for growth and development have translucent leaves that yellow and fall off suddenly.

Table IV provides a list of plants that will grow in hot and dry conditions.

Table III. Plants requiring four hours of direct sunlight or bright, indirect light. Locations include 4-8 feet from windows in average well-lit areas.

Common Name	Scientific Name
Air plant	<i>Aechmea fasciata</i>
Zebra plant	<i>Aphelandra squarrosa</i>
Norfolk-island pine	<i>Araucaria heterophylla</i>
Fern asparagus	<i>Asparagus setaceus</i>
Sprenger's asparagus	<i>Asparagus densiflorus</i> 'Sprengerii'
Gold dust tree	<i>Aucuba japonica</i> 'Variegata'
Rex begonia	<i>Begonia</i> spp.
Caladium	<i>Caladium bicolor</i>
Peacock plant	<i>Calathea makoyana</i>
Spider plant	<i>Chlorophytum comosum</i>
Areca palm	<i>Chrysalidocarpus lutescens</i>
Ti plant	<i>Cordyline terminalis</i>
Umbrella plant	<i>Cyperus alternifolius</i>
House holly-fern	<i>Cyrtomium falcatum</i>
Dumbcane	<i>Dieffenbachia maculate</i>
False aralia	<i>Dizygotheca elegantissima</i>
Janet Craig dracaena	<i>Dracaena deremensis</i> 'Janet Craig'
Warneckii dracaena	<i>Dracaena deremensis</i> 'Warneckii'
Red edge dracaena	<i>Dracaena marginata</i>
Sander's dracaena	<i>Dracaena sanderiana</i>
Gold dust plant	<i>Dracaena surculosa</i>
Flame violet	<i>Episcia cupreata</i>
Crown-of-thorns	<i>Euphorbia milii</i>
Fatshедера	<i>Fatshedera lizei</i>
Weeping fig	<i>Ficus benjamina</i>
Rubber plant	<i>Ficus elastic</i> 'Decora'
Fiddle-leaf fig	<i>Ficus lyrata</i>
Velvet plant	<i>Gynura aurantiaca</i>
English ivy	<i>Hedera helix</i>
Nerve or prayer plant	<i>Maranta leuconeura</i> 'Kerchoviana'
Cut-leaf philodendron	<i>Monstera deliciosa</i>
Tricolor bromeliad	<i>Neoregelia carolinae</i>
Boston fern	<i>Nephrolepis exaltata</i> 'Bostoniensis'
Peperomia	<i>Peperomia obtusifolia</i>
Japanese pittosporum	<i>Pittosporum tobira</i> 'Variegata'
Philodendron	<i>Philodendron domesticum</i>
Fiddle-leaf philodendron	<i>Philodendron bipennifolium</i>
Self-heading philodendron	<i>Philodendron wendlandii</i>
Climbing philodendron	<i>Philodendron</i> 'Red Princess'
Aluminum plant	<i>Pilea cardierei</i>
Staghorn fern	<i>Platyserium</i> spp.
Pteris fern	<i>Pteris</i> spp.
Spathiphyllum	<i>Spathiphyllum clevelandii</i>
Nephtytis	<i>Syngonium podophyllum</i> 'Emerald Green'
Nephtytis	<i>Syngonium podophyllum</i> 'Green Gold'
Vriesea	<i>Vriesea carinata</i>
Australia umbrella tree	<i>Brassaia actinophylla</i>

Table IV. Plants that will grow in hot and dry conditions.

<i>Common Name</i>	<i>Scientific Name</i>
Tiger aloe	<i>Aloe variegata</i>
Zebra plant	<i>Aphelandra squarrosa</i>
Mother of thousands	<i>Kalanchoe daigremontiana</i>
Air plant	<i>Kalanchoe pinnata</i>
Lamb's ear kalanchoe	<i>Kalanchoe tomentosa</i>
Sedum	<i>Sedum</i> sp.

Humidity

Most houseplants are injured when humidity is under 20 percent, with the exception of succulents. Humidity levels between 40 and 60 percent are preferred. Symptoms of low humidity are leaf drying and curling.

During winter, humidity may reach very low levels, under 20 percent, in the home. The best way to increase humidity is to use a room humidifier or a whole-house humidifier which is attached to the furnace. Use a portable humidity monitor to determine the humidity level and monitor fluctuations over time.

Syringing (spraying plants with clean water) removes dirt from the leaves and increases humidity to a degree. Be sure to syringe plants early in the day to allow the leaf surface to dry. High humidity areas such as bathrooms and kitchens often are ideal for plants. Consider growing plants that require very high humidity levels (greater than 50 percent) in terrariums or greenhouses.

Containers

Houseplants should be grown in containers with drainage holes. Drainage holes can be covered with a coarse piece of window screen or similar product to prevent growing media from leaching out.

Both plastic or clay pots are available. Media in clay pots dry out faster than in plastic pots, so people who tend to overwater should use clay pots, although that is not a cure-all for incorrect watering. Clay pots are more difficult to clean than plastic pots because clay absorbs chemicals and salts. To clean pots, soak them in very hot water for 24 hours. Use a stiff brush to remove soil. To sterilize pots, soak them in a solution of one part chlorine bleach to nine parts water and then rinse thoroughly.

Rooting Media

Plants obtain water, oxygen, and nutrients from the rooting media in which they are growing. With few exceptions, a well-drained growing media is important to obtain optimum houseplant performance. Most foliage plants thrive in a mix of one part sandy loam soil, three parts organic matter and one part perlite. Mixtures for succulents and cacti require additional coarse-textured material, such as sharp sand. Various growing mixes are available for purchase to meet the growing needs of houseplants.

Fertilizing

The amount and frequency of fertilizing depends on the type of plant, desired growth rate, available sunlight, media mix, frequency of watering, and type of fertilizer. For actively growing plants, fertilize every two months between March and September. Do not fertilize dormant plants.

A number of fertilizer formulations are available for houseplants. Specific formula recommendations will vary with the type of the houseplant. A general formulation contains equal amounts of nitrogen and potassium and twice as much phosphorus, such as 5-10-10 or 10-20-10. A balanced ration fertilizer with equal parts of nitrogen, phosphorus, and potassium, such as 10-10-10, also can be used. Follow all label instructions when mixing and applying fertilizer to houseplants.

Avoid over-fertilizing houseplants, especially for plants growing under low-light intensity. Burned or dried leaf margins and wilted plants often are a sign of excess fertilizer application. Leaching the potting media in the container with water to help remove excess salt and fertilizer is beneficial.

Watering

Although no exact recommendations can be given for watering plants, there are general guidelines. If the growing media is excessively dry or the plant is root-bound in the container, water the plant from the bottom of the container by placing the container in a larger pan of tepid water to hydrate the growing media until the top of the media in the container is moist to the touch.

Thoroughly wet the growing media in the container at each watering. Water should drain out the bottom of the pot after watering.

Frequency of watering depends on many factors, including moisture needs, humidity levels, plant types or species, and containers. To determine if the media is at the correct moisture level for the needs of a specific houseplant species, test it by placing a finger 1 to 2 inches into the media.

Larger plants need more water compared to smaller plants. If the container is too small for the plant and the amount of growing media has decreased over time, watering frequency will increase. Don't water more frequently than required. Wet soils can lead to root rot. Excessively wet soils lack the oxygen required for root growth. Yellowing foliage results from poor soil aeration.

Excessive fluoride levels in the water can cause tip and leaf scorching. Plants like *Dracena*, *Cordyline*, and *Chlorophytum* should be watered with rain water if possible. Tap water can be used but should be allowed to stand for at least 24 hours in containers to allow chlorine and fluorine to dissipate. Always use water that is room temperature for houseplants.

Insects and Related Pests

Insects, mites, and a number of other related pests occasionally injure the flowers and foliage of houseplants. The most common include aphids, mealybugs, whiteflies, scale insects, and spider mites. Other pests such as fungus gnats, caterpillars, ants, millipedes, and slugs usually cause more alarm than damage.

Diseases

The best way to prevent pest damage is to avoid the initial infestation. Carefully inspect leaves, stems, and soil of newly acquired plants for the presence of insects, mites, and other unwanted guests. Similar inspections should be carried out before moving plants back into your home for the winter. Always isolate these plants for a week or two and watch them closely for signs of developing pest infestations.

If plants are to be repotted, use a commercially prepared, pasteurized potting soil to avoid introducing ants, springtails, fungus gnats, sowbugs, and other soil inhabitants. Removing dead leaves and debris from plants and pots also helps eliminate hiding places used by many houseplant pests. When handling infested plants, be careful not to accidentally transfer insects and mites from one plant to another.

There are a number of non-chemical approaches for eliminating insect and mite infestations. If only a few leaves or stems are infested, they can be removed and discarded. Soil insects can be effectively eliminated by repotting plants using a pasteurized potting soil. Large pests such as beetles, caterpillars, or slugs can be picked off by hand and destroyed. Gently wiping the leaves and stems with cotton swabs dipped in rubbing alcohol is an effective means of controlling aphids or mealybugs, especially if they are not too abundant.

Another useful technique involves washing plants with soapy water. For best results, repeat the washing procedure two or three times at five- to seven-day intervals to destroy any pests (especially eggs) missed during earlier washings. Always rinse plants for several minutes after treatment to avoid soap injury to the foliage. When plants have heavy pest infestations, disposal of the entire plant may be the best solution. If possible, take a cutting and start over again.

In many cases, pesticide sprays offer the most practical approach for controlling insects and mites on houseplants. When treating plants, be certain the selected product is specifically labeled for both the target pest and plant species. This is important because not all products kill all insects, and some pesticides can injure your plants. In many cases, the label will include a list of plants that can be injured by the product. To be safe, test-treat a few plants and inspect them two to three days later for any signs of chemical injury.

If only a few plants are to be treated, a commercial, ready-to-use insecticide spray specifically labeled for controlling insects and mites on houseplants may be the best choice. Products labeled for control of houseplant pests are available in many formulations. These include traditional insecticides such as carbaryl, disulfoton, imidacloprid, and synthetic pyrethroids (bifenthrin, cyfluthrin, permethrin, resmethrin, sumithrin, tetramethrin), as well as reduced risk products including horticultural oils, insecticidal soaps, neem insecticides, and *Bacillus thuringiensis* var. *israellensis* for fungus gnats.

The protected indoor environment of a home or office usually is not favorable to plant diseases due to the continuous low humidity compared to a greenhouse or an outdoor environment. However, diseases can be a problem if preventive measures are not taken. Fungi, bacteria, viruses, and nematodes are the four major groups of pathogens that cause plant diseases. Diseases caused by these organisms are referred to as biotic diseases, whereas those caused by nonliving agents such as environmental factors and chemicals are known as abiotic diseases or disorders.

Houseplant diseases caused by bacteria usually produce angular lesions frequently surrounded by yellow halos or water-soaked areas. Fungi produce a wide variety of symptoms including root rots, stem lesions, leaf spots, mildews, and rusts. Diseases caused by viruses often appear as abnormal or distorted growth. Nematodes are microscopic worms that mostly feed on roots, causing the plant to become stunted, yellowed, and generally unthrifty.

Abiotic disorders include edema, which resembles wart and cork-like structures caused by excessive watering; wilting and leaf drop caused by inadequate watering; yellowing caused by insufficient fertilization or lighting; brown leaf tips and edges caused by exposure to hot dry air, improper watering, or salt accumulation; and bud drop caused by inadequate or excessive fertilization and excessive soil dryness or wetness.

Most diseases of houseplants in the home or office can be managed.

- Purchase healthy, pathogen-free plants.
- Grow plants in clean containers and in well-drained, pasteurized commercial potting media.
- Maintain optimum growing conditions for the plant.
- Avoid overwatering or overfertilizing.
- Keep the foliage dry by avoiding water splash and ensuring good air circulation.
- Dispose of diseased plants or plant parts.

Acknowledgment

Tables I-IV are used with permission from Purdue University Extension and B. Rosie Lerner. The information originally appeared in "Indoor Plant Care," www.hort.purdue.edu/ext/ho-39.pdf.

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