Tips for Growing Houseplants in Maine

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Cover photos: Pixabay

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This newly revised and expanded bulletin addresses the basics of keeping houseplants. It will help you diagnose common problems with your houseplants, such as insects and diseases; overwatering or underwatering; improper lighting, temperature, or humidity; and insufficient pot size (root-bound). The series addresses how to start new plants from old plants, and also the unique challenges of growing houseplants in Maine, including the use of artificial light.

Caring for Houseplants in Maine

Foliage plants and flowering plants can brighten any home. People who keep plants in their home report feeling happier and more relaxed. Natural aesthetic beauty is soothing to people, and nurturing plants reduces stress levels. Research shows that workers are more effective when they have plants around them and that people are more cheerful when they are surrounded by plants. Plants also provide an important link to nature, and it's interesting to watch plants change and grow throughout the year. It is very rewarding to grow a prize specimen, whether it's an orchid or a cactus.

Most of our houseplants come from tropical and subtropical climates. They are well adapted to the warm conditions in our homes and offices. Because they evolved near the equator, they have adapted to similar day lengths throughout the year, which we maintain in our homes and offices through the use of artificial lights.

But problems may crop up when growing houseplants, and this can be very discouraging. The problems encountered are often attributed to disease or insect infestation. But oftentimes problems can be traced to the conditions in which the plants live.

Growing houseplants can be more enjoyable by following a few simple guidelines:

- Choose a healthy, vigorous plant with a good root system (a small tug on the stem of the plant can assure it has a good root system, if it pulls out easily, it may have just been planted, or the roots have rotted off), lustrous green or typical color, and no sign of insect or disease damage.
- Know the correct identification of the plant and the conditions it requires.
- Know the conditions in the area where the plant is to be located.
- Choose a plant to match available conditions.
- Check plants frequently for any signs of change (positive or negative).
- If a problem develops, try to determine the cause so it can be avoided in the future. To determine how to avoid, prevent, and treat problems refer to Dealing with Houseplant Problems in Maine on page 2, and Controlling Insects and Disease in Houseplants on page 4.

Light and Temperature

Unless specially planned lighting is arranged, artificial light under a table lamp for a few hours each night does not make up for a continued lack of sunlight or indirect bright light. For more on see page 9, Growing Houseplants Under Artificial Lights in Maine.

Ideal temperatures for foliage plants are 68–70 degrees during the day and slightly lower at night. Flowering plants retain their blossoms longer at these lower temperatures. Remember that windowsill locations are much colder during the winter than at a little distance within a room.

Watering

Plants can be watered from the top, bottom, or by automated irrigation system, but make sure there is good drainage so that water does not stand in the pot and soil. Plants in clay pots need watering more frequently than do those in glazed or plastic pots because the clay pot absorbs water. Most houseplants do best if watered periodically, not daily. When you water, add enough water to fill all the air space in the pot. Lifting the pot up can help determine if the pot is completely watered. Allow the excess water to drain out and don't let the pot stand in water in its tray. Do not water again until the soil is dry an inch from the surface. A mister can be used for gently watering cuttings or cleaning foliage.

Humidity

Many tropical plants require higher relative humidity than we normally sustain in our homes. You can increase the humidity around plants by grouping them together, or by placing humidity-requiring plants in the bathroom or over a sink or an aquarium. Misting plants has no long-lasting effect on humidity.

Fertilizing

If plants have been repotted in the fall into a soil containing fertilizer, they probably will not need more fertilizer until spring, but if they're growing in a soilless mix, they will need regular fertilizing. Fertilizers labeled for houseplants in powder, liquid, or tablet form may be used following the manufacturer's directions.

Maintenance

To keep the plants healthy, turn them occasionally to expose all sides to the light source. Also, wash the leaves regularly to remove dust accumulation, but do not use any oily substance on the leaves to keep them shiny—it attracts dust.

Houseplant Care During the Winter

Maine's long, dark winter can present challenges to maintaining lush houseplants year-round.

When day length shortens and the heat goes on in the home or the woodstove is fired up, houseplants sometimes begin to yellow and drop their leaves. You may need to move some plants to a different place in the home and treat them differently than you do during the summer.

Flowering plants need at least a half-day of direct sunlight during each 24-hour period to develop flower buds. Cacti and many succulents require a sunny place, and coleus and crotons need direct sun to maintain their decorative foliage colors.

Foliage plants such as ivies, philodendrons, foliage begonias, and peperomias do well in indirect light rather than direct sunlight. African violets and gloxinias, which require indirect bright light during the summer, need more direct light in the winter.

When plants are used for decorative accents in a room, they may get insufficient light. You can fix this problem by rotating them to a bright light area every few days — perhaps a week or two in the low light area, then several days in a sunny location. As an alternative, have two sets of plants and shift them every week; one set receives bright light while the other is used in the decorative scheme.

Be prepared to adjust watering practices as you move plants to accommodate the season. Water needs may go down if plants receive less light or, conversely, may increase due to the drying effect of heating the home.

Dealing With Houseplant Problems

Overwatering

Overwatering and/or poor drainage reduces soil aeration. Roots die or are restricted and water and essential nutrients are not absorbed. The result may be browning of leaf tips or margins, leaf yellowing, leaf drop, wilting of the entire plant, and little or no new growth. Soil type, plant type, container type, time of year, and the environment are factors that affect ideal frequency of watering. Soils may look dry when they are not or the reverse may be true. There is no given time, such as once a week or every 2 to 3 days, for watering foliage plants. Supply water as needed, not on a time schedule. Most plants should be watered when the top inch of soil feels dry. For drought tolerant plants, like cacti and succulents, the soil should be allowed to dry completely between waterings. Providing good drainage and using a potting mixture of equal portions garden loam, perlite or coarse sand, and peat moss will help to avoid overwatering problems. Plants should not have standing water in their trays.

Underwatering

Overwatering is a more common source of issues for houseplants than underwatering, but when underwatering is an issue the cause is usually frequent but light watering. Regardless of how often you water, each watering should thoroughly wet the soil and the entire root ball. The excess water should drain out of the container and the tray should be emptied.

Tools for watering your houseplants can include a watering can, mister, a squeeze wash bottle for watering small plants, and a baster for removing excess water from the trays of large plants.

Etiolated succulent.

Root bound spider plant (*Chlorophytum comosum*).

Overfertilizing

Too much fertilizer injures plant roots and may result in many of the same symptoms as those stemming from overwatering. Follow manufacturer's directions for the correct amount of fertilizer.

Improper light

Although excess light (full sun) may result in leaf spotting, leaf yellowing, or wilt, this is unlikely in most home growing situations. However, sudden increases in light levels, like moving a plant outdoors into full sun, is likely to damage even sun-loving plants. Insufficient light, which is much more common in home growing situations, may cause leaf yellowing, drop of older leaves, weak new growth, new leaves smaller than normal, and with some flowering plants, failure of flower buds to develop or bud drop before opening. Etiolation, when stems become long and weak, with large spaces between leaves, is a common sign of insufficient light, especially in succulents grown indoors.

Low humidity

Most foliage plants grow best at relative humidity near 50 percent. Many indoor environments in the Maine winter have much lower humidity. Browning of leaf tips and margins may occur if the humidity is low. Although humidifiers can be used to effectively raise humidity levels, proceed with caution because excessive humidity levels in a home can result in the growth of harmful and damaging molds. Although it may be satisfying, misting plants does not provide the consistently high humidity levels needed. For those who are particularly passionate about humidity-loving plants, such as ferns or orchids, it may be worth investing in enclosures such as glass cloches or terrariums.

Root-bound

When the roots of a plant are a tight mass all around the root ball, that plant is said to be root-bound. This condition makes it difficult to water and fertilize properly. The result is leaf yellowing. The plant should be transferred to a pot that is 2-4 inches larger in diameter.

Insects and mites

Mites, scale insects, and mealybugs can be a problem, especially when foliage plants are kept outside in the summer. Learn to recognize these pests and follow recommendations of entomologists to eliminate them. See Table 1 on page 5 for a list of common pests found in the home.

Pesticide or air pollution injury

It may occasionally be necessary to use chemicals on houseplants to control spider mites, scale insects, etc. Severe injury can occur on some kinds of plants, especially when these chemicals are not used according to directions on the label. Combustion by-products from faulty propane or natural gas appliances can also affect plants. Plant injury may be in the form of marginal leaf burn, yellowing, spotting, or distortion of normal growth. Both inorganic and organic pesticides may cause injury on some plants.

Temperature

Temperatures 68 to 70 °F are best for most foliage plants. Homes with wood heat may experience very high temperatures, which can cause problems. In public buildings, night and weekend temperatures may be reduced to levels that can injure more temperature-sensitive plants. Some flowering houseplants grow and

flower best at temperatures near 60 °F and therefore may not do well in many homes. Nighttime temperatures of 60–65 °F help prolong blooms on some flowering plants.

Acclimatization

Foliage plants that are sold to the consumer in the garden store or other retail outlets are propagated and allowed to grow to salable size in greenhouses or commercial foliage nurseries in Florida and other warm climates. The growing conditions — high humidity, high light intensities, continuously moist soil, lots of fertilizer — are quite different from those in the indoor environment of the home or public buildings, especially during the long Maine winter. Moving plants suddenly from these optimum growing areas into the low light and dry atmosphere of indoors can cause leaf yellowing, leaf drop, or other problems. Acclimatization — adjusting plants to lower light, lower fertility, less frequent watering, etc. — should be done gradually. Acclimatization should be and usually is done before the plants are marketed. But sometimes "bargain" plants not properly acclimatized are offered for sale and problems occur in the home environment. Give new plants a week or two to adapt to your home's conditions before repotting to avoid the double stress of acclimatization and transplant shock.

Poor root development or root rot

Poor root development may be a result of excess or insufficient water, poor drainage, or improper growing medium. If root issues are suspected, gently remove the plant from the pot to inspect the root system. Healthy roots should generally be firm and white. Signs of root rot include brown, mushy, or soft roots. For more information see Insects and Disease in Houseplants on page 4.

Controlling Insects and Disease in Houseplants

Prevention of Insect and Disease Infestations

- Healthy plants will be less susceptible to infestation.
- Examine plants, including the underside of leaves, for disease, insects, eggs, webbing, or feeding damage before purchasing. It's a good idea to isolate new plants for a month; control infestations if necessary.
- Regularly inspect your plants as you water. Controlling a few insects is much easier than controlling a large infestation.
- Once every three to four months, wash all your plants with warm soapy water and a soft cloth to remove any built up dust. Hairy textured leaves like African violets can be brushed with a soft brush to remove dust. A regular bath may be all that is needed to remove many insects. Use two teaspoons of a mild liquid dishwashing detergent to one gallon of water. Keep the soap mixture out of the soil.
- Use sterilized soil for potting to prevent development of soil insects.

Insecticides

Before spraying a plant with an insecticide, make sure you know what the insect is (Table 1) (University of Maine Cooperative Extension Insect Lab) and follow the label directions very carefully. Consider removing the infected leaves or discarding infested plants rather than treating them with a toxic substance.

Move the plants to be sprayed into a well-ventilated area, such as the garage, basement, or a room with a fan. If the weather allows, treat plants outdoors and away from direct sunlight. Bring plants back in when dry.

Note: *Check all pesticide labels carefully. Products may not be registered for use on all varieties of plants or may not be tested on all rare or unusual varieties. If the host and pest are not listed on the label, do not use the pesticide. Systemic pesticides, such as imidacloprid (BioAdvanced 2 in 1 Plant Food and Insect Control Spikes or Bonide Systemic Houseplant Insect Control), work by being absorbed into the plant, via the roots, and are ingested by pests when they feed on the plant. Systemics should not be used in combination with beneficial insects.*

Table 1: Common Houseplant Insects and How to Control Them

Pest	Photo	Description	Damage	Control
Aphids		Tiny green, brown, or black insect, located on the undersides of leaves. Photo: G. Dill	Feeding damage causes stunted plant growth and curled or distorted foliage	Wash off with water, insecticidal soap,or neem, or use imidacloprid
Fungus Gnat		Adult is a small fruit fly–type insect. Larvae is a small white worm or maggot that lives in the moist soil. Photo: C. Armstrong	Minimal damage	Allow the soil surface to dry between waterings or use *Bacillus thuringiensis subsp. israelensis*
Mealybugs		Scale insect with white cottony appearance on stems, undersides of foliage, and on nodes (where the leaf or bud attaches to the plant's stems). Photo: US National Collection of Scale Insects Photographs, USDA ARS, Bugwood.org	Feeding damage causes stunted plant growth	Wipe off with cotton swab dipped in alcohol, or use insecticidal soap, or neem, or use imidacloprid
Mites: Spider		Microscopic light-colored arachnids (not insects). Photo: J. Dill	Produce webbing on foliage and stems	Discard heavily infested plants; or horticultural oil (can cause damage)
Mites: Cyclamen		Microscopic arachnids not visible without magnification. Photo: Jody Fetzer, Maryland National Capital Park and Planning Commission, Bugwood.org	Feeding produces distorted yellowish foliage	Discard heavily infested plants or use insecticidal soap.[1]
Scale		Oval or round brown insects located on stems and leaves. Photo: JWhitney Cranshaw, Colorado State University, Bugwood.org	Insects suck plant juices, resulting in poor or stunted plant growth. Black fungus may grow on honeydew (sap) excreted	Discard heavily infested plants; wash off with water, wipe off with cotton swab dipped in alcohol, or use insecticidal soap, neem oil, or horticultural oil (can cause damage).[2]
Springtails		Minute in size (1/8th to 1/16th of an inch in length), dark-colored but some can be white or light in color. Live in moist soils. Photo: J. Dill	They are beneficial insects because they feed on fungi, pollen, algae, and decaying organic matter	
Thrips		Extremely tiny (1/8th to 1/4 inch) insects. Adults are light tan to dark brown; appear white when young. Photo: J. Dill	Feed on foliage and flowers, causing them to have a silvery appearance and become distorted and discolored	Use neem, horticultural oil, spinosad,or pyrethrins
Whitefly		Small, white, gnat-like insect. Photo: Frank Peairs, Colorado State University, Bugwood.org	Adults and young feed on leaves, causing the leaves to turn pale yellow or white	Wash or use alcohol swab; insecticidal soap, or neem, or use imidacloprid

Adapted with permission from Preventing, Diagnosing, and Correcting Houseplant Problems from Penn State University.

[1]Bessin, R. 2019. Cyclamen Mite in the Greenhouse. University of Kentucky College of Agriculture https://entomology.ca.uky.edu/ef422
[2] Klass, C. 2012. Scale on Houseplants. Cornell University http://idl.entomology.cornell.edu/wp-content/uploads/Scales-on-Houseplants.pdf

Table 2: Chart of Pesticides, Active Ingredients, Brand Names

Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement and does not imply approval to the exclusion of other suitable products or firms.

Active Ingredient	Trade Name(s)
Bacillus thuringiensis subsp. israelensis	Gnatrol, Knox-Out Gnats
Neem oil (Clarified hydrophobic extract of neem oil)	NimBioSys Neem Oil, Bonide Captain Jack'sNeem Oil
Insecticidal soap (potassium salts of fatty acids)	Bonide Insecticidal Soap Multi-Purpose Insect Control, Garden's Alive! Plant Guardian Houseplant Insecticidal Soap, or Safers Insect Killing Soap
Imidacloprid	BioAdvanced Fertilizer with Imidacloprid plant spikes, Bonide Systemic Houseplant Insect Control
Horticultural oil (mineral oil)	Bonide All Seasons Horticulture and Dormant Oil, Safer Brand Horticulture and Dormant Oil Spray
Spinosad	Bonide Spinosad Concentrate (AKA Captain Jacks Deadbug Brew), Gardens Alive! Bulls-Eye Bioinsecticide, Monterey Garden Insect Spray
Pyrethrins	Bonide Pyrethrin Garden Insect Spray, Gardens Alive! House Guardian Insect Spray, Safer Brand End All Insect Killer

Table 3: Houseplant Disorders and Diseases

Abiotic (environment)[1]		
Symptom	**Photo**	**Common Cause**
Spindly plants / leggy growth/ weak growth		– Not enough light intensity or length of time in the light – Root system damaged from being kept too wet Photo: Julia Weisennhorn, UMN Extension
Few flowers		– Poor lighting conditions Photo: R. Long
Yellowing leaves		– Overwatering – Not enough light – Relative humidity is too low – Soil drains poorly and remains wet for too long – Injured by low temperatures resulting from a draft caused by an open door, window, or air conditioner – Natural senescence (aging) of older leaves (normal process) – Lack of nitrogen Photo: R. Long
Leaves sun-scorched/ sunscalded	 	– Receiving too much direct sun Photos: Tina Smith, UMASS Extension, retired |D. Coffin
Brown leaf tips	 	– Chemical burn from overapplication of pesticide or fertilizer – Soft water – Soil remains dry for extended periods of time – Temperature is too low Photos: A. Smart | R. Long
Small leaves		– Soil remains either too wet or too dry – Lack of proper nutrients Photos: R. Long
Wilting plant		– Soil remains either too wet or too dry Photos: University of Wisconsin

Adapted with permission from Preventing, Diagnosing, and Correcting Houseplant Problems from Penn State University.

[1] Kelly, K. 2016. Preventing, Diagnosing, and Correcting Houseplant Problems, Penn State University, https://extension.psu.edu/preventing-diagnosing-and-correcting-common-houseplant-problems

Table 3: Houseplant Disorders and Diseases (continued)

Biotic (disease organism)[2]				
Symptom	Photo	Organism	**Sympton**	**Management**
Anthracnose		*Colletotrichum* and *Gloeosporium* fungi Photos: Margery Daughtrey, Cornell University	Leaf tips turn yellow, then brown; entire leaf may die	Remove infected leaves and avoid misting leaves
Leaf spots		Fungi and bacteria Photos: R. Long	**Fungal:** Leaf spots appear brown and may have a yellow halo; tiny black dots (fungal bodies) can be seen with a magnifying lens on the brown tissue; portions of or the entire leaf may die **Bacterial:** Leaf spots appear water-soaked and may also have a yellow halo	Remove infected leaves; increase air circulation; avoid getting water on leaves
Powdery mildew		Fungus *Oidium* genus Photos: B. Watt	White powdery fungal growth on foliage; leaf distortion; leaf drop may result	increase air circulation around plant; avoid saturated soils; remove severely infected foliage
Root and stem rots		*Botrytis* species (sp.), *Pythium sp., Alternaria* sp., *Phytophthora* sp., *Sclerotinia* sp., and *Rhizoctonia* sp. Photos: D. Coffin	Brown to black soft or mushy roots or lack of roots; girdled soft stems with a brown or black lesion near the soil line; plants wilt, show nutrient deficiency symptoms, and may eventually die	Cut back on watering; dispose of infected plants and sterilize any pot that will be reused

Adapted with permission from Preventing, Diagnosing, and Correcting Houseplant Problems from Penn State University.

[2] Kelly, K., Preventing, Diagnosing, and Correcting Houseplant Problems, Penn State University, https://extension.psu.edu/preventing-diagnosing-and-correcting-common-houseplant-problems

Growing Houseplants Under Artificial Lights in Maine

Why Use Grow Lights?

Insufficient light is one of the main reasons plants often grow and bloom poorly, have light-colored foliage, and spindly new growth. Inside a home, the light intensity varies by location. South-facing windows get the most amount of light, east-facing windows receive morning light, west-facing windows receive afternoon light, and north-facing windows get the least direct sunlight. The farther from a window or the smaller the window, the less light available. Also, the presence of trees or other obstructions outside a window, roof overhangs, and season of year will impact the amount of light in a room.

Grow lights are an excellent way to grow houseplants and can be used year-round. Grow lights (Figure 1) eliminate the problems associated with low light levels, because they make every day sunny as far as the plants are concerned. Grow lights can turn any poorly lit corner into a good area to grow plants. They also decrease temperature problems, because plants can be placed where they are not subject to winter's cold or summer's heat, as they are on window ledges.

Table 4 lists the typical light requirements for plants at various growth stages. Light is measured in photosynthetic photon flux density (PPFD) using a photosynthetically active radiation (PAR) meter. Several handheld meters and smartphone applications can quickly measure the light intensity of different areas.

What to Grow Under Lights

Most plants, both small and large, grow well under grow lights. Light emitting diodes (LEDs) are an excellent light for growing plants. LED lights can be installed just about anywhere in and around the home to supply full or supplemental lighting for plants.

Plants have different light requirements, or daily light integral (DLI). Daily light integral is the amount of photosynthetically active radiation (PAR) received over a duration of time or "photoperiod." Think of DLI as light filling a bucket. You could turn the water on high and fill the bucket quickly, which would be likened to high light intensity for 12 hours or less. Or you could fill a bucket by allowing the water to trickle in over a longer period, which could be likened to growing seedlings under low intensity lights for 18 hours a day. Table 5 shows recommended light levels for several common ornamental plant varieties.

When plants are too close to light, the petioles (leaf sterns) are short, and leaves are crinkled and perhaps

Figure 1. LED light being used to germinate seeds.

Table 4: Light Intensities Required For Various Plant Growth Stages.

Growth Stage	Light Intensity (PPFD)
Seedling/Clone	Less than 100
Vegetative	100–500
Flower/fruit	400–1,200

Table 5: Light Intensities Required For Common Ornamental Plants.

Plant	PPFD
African violets	50–150
Gloxinias	100–400
Herbs	100–500
Orchids	40–500
Philodendrons	50–250
Spring bulbs	100–400
Succulents	100–200

leathery to the touch. When plants are too far away from light, the leaves are thin, internodes (space between the leaves) are much longer on new growth, new leaves are smaller and lighter green, and leaf petioles are long.

For large houseplants, a high intensity discharge (HID) light, such as an LED or metal halide at least 3 feet from the top of the plant will not cause a heat problem and will encourage good plant growth. You will have to experiment with light placement because conditions vary. Most plants will flourish if supplied with approximately 25 watts of light per square foot for LEDs. HID lights such as metal halide or high-pressure sodium would require about double the amount of wattage as an equivalent-sized LED. So, for a 1-sq-ft area you would want 50 watts of light. Intensity can be adjusted by changing how high the light is placed above the top of the plant canopy. One advantage of LEDs is that they are dimmable, with many models having a dial or switch that can be used to turn the brightness up or down.

Sixteen to 18 hours of artificial light a day is best for most plants. You can control the light period by hand or by installing a simple timer. Care for plants under artificial light as you would under natural conditions. Carefully monitor water needs, because plants dry out quickly when the house is heated, and humidity levels are low.

What You Will Need

Three main types of grow lights can be used for plants: fluorescent, LEDs, and HIDs. Primary considerations when purchasing are budget and heat management. T5 or T8 fluorescent lamps are moderately energy-efficient lights for seedlings, clone, and foliage plants, although this type of lighting is becoming outdated, similar to incandescent lighting in the 2010s. In T5, "T" stands for tubular-shaped and the "5" denotes that it is five-eighths inch in diameter. The slim bulb diameter and low heat output of fluorescent lamps are what make them an attractive choice for providing usable light to plants. If you are purchasing a new light, it would be best to purchase LEDs based on their energy efficiency and longevity.

LEDs are the most common lights for small houseplants (Figure 2.). They are inexpensive to operate and give off little heat. Spectrum, or light color, will be determined by what type of light you choose to use. It is measured in Kelvin (K) and ranges from 1,000 to 10,000, with lower numbers appearing red and higher numbers appearing blue. The type of plant and its growth stage will determine the optimal spectrum of light. Typically, seedlings, clones, and vegetatively growing plants prefer a bluer spectrum, which would correspond to Kelvin values of 4,000–10,000. Flowering plants generally prefer a redder spectrum, corresponding to Kelvin values of 1,000–3,500K.

Purple, or "blurple," lights are a combination of red and blue diodes that appear purple when lit. For optimal plant growth the best lighting balance remains "full-spectrum," or white, lights.

HID lights, such as metal halide or high-pressure sodium, can be used for plants that require high light levels or if the light is being hung a considerable distance (5 or more feet) above the canopy of the plant. Metal halide lights are commonly used for vegetative or foliage plants; high-pressure sodium lights can be used to flower or fruit plants indoors. With a bit of research and the right lights, you can keep your houseplants healthy and thriving through the long dark Maine winter.

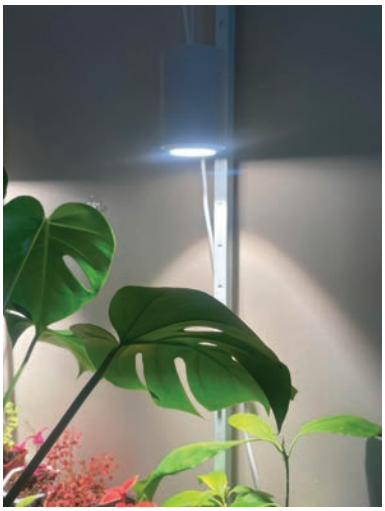


Figure 2. LED supplemental lighting.

Creating New Plants from Old Plants

A great many houseplants can be propagated by one or several types of cuttings. Cuttings, or slips, are the stems or leaves cut off the parent or stock plant. These severed parts, after a period of time, generate new stems and roots. The most common types of cuttings are stem cuttings and leaf cuttings.

Stem Tip Cuttings

Stem tip cuttings are made from the ends of actively growing shoots. The cuttings can range from 3 to 5 inches and must be removed at a point just below a leaf (Figure 3). For best results, the cutting should have three or four leaves. Remove any leaves on that portion of the stem being inserted into the rooting medium.

Figure 3. Stem tip cutting of Jade plant (*Crassula ovata*)

Leaf petiole cutting of African violet (*Streptocarpus sect. Saintpaulia*).

Whole leaf cutting of Jade plant (*Crassula ovata*).

Common House Plants to be Propagated by Stem Tip Cutting

- *Begonia*
- *Peperomia*
- *Coleus*
- *Philodendron*
- English Ivy (*Hedera helix*)
- Poinsettia (*Euphorbia pulcherrima*)
- *Fuchsia*
- Rubber plant (*Ficus elastica*)
- Geranium (*Pelargonium*)
- Jade plant (*Crassula ovata*)
- Wax plant (*Hoya*)
- Inch Plant (*Tradescantia*)
- Norfolk Island pine (*Araucaria heterophyll*)

Leaf Cuttings

Leaf cuttings can be made from leaves with or without petioles (leaf stem). There are four common types of leaf cuttings. These include the leaf petiole cutting, whole leaf cutting, leaf bud cutting, and leaf section cutting.

Leaf Petiole Cuttings

Leaf cuttings with the petioles (leaf stems) are called leaf petiole cuttings. In this case, the leaf is cut from the parent plant at the node (point at which the leaf stem joins the main stem) and stuck into the rooting medium.

Common House Plants to be Propagated by Leaf Petiole Cuttings

- *Peperomia*
- *Begonia*
- Wax plant (*Hoya*)
- African violet (*Streptocarpus sect. Saintpaulia*)

Whole Leaf Cuttings

Leaf cuttings without the leaf stems are called whole leaf cuttings. In this case, the leaf is cut from the parent plant and the base inserted into a rooting medium. Roots and leaves eventually form at the base of the leaf.

This propagation method is commonly used for many succulents. Succulent leaves can be gently snapped off, rather than cut, and placed on the rooting medium surface.

Common House Plants to be Propagated by Whole Leaf Cuttings

- Cacti
- Jade plant (*Crassula ovata*)

Leaf Bud Cutting

Leaf bud cuttings consist of a leaf attached to a 1- or 2-inch section of stem. A hidden or dormant bud is present at the node. In this case, the stem section is laid on its side and inserted into the growing medium.

Common House Plants to be Propagated by Leaf Bud Cutting

- English ivy (*Hedera helix*)
- *Peperomia*
- Grape ivy (*Cissus alata*)
- *Philodendron*
- Geranium (*Pelargonium*)
- Pothos (*Epipremnum aureum*)

Leaf Section Cutting

Leaf cuttings consist of cut up sections of leaf. On a snake plant, for example, leaves are cut into 2–3-inch-long sections and inserted into the rooting medium, bottom end first. New roots and leaves form at the base of these cuttings.

Common House Plants to be Propagated by Leaf Section Cuttings

- Rex Begonia
- Snake plant (*Dracaena trifasciata*)

Procedure for Rooting Cuttings

Before making your cuttings, assemble the necessary materials. Depending on the method you use (see below), you may need some or all of these materials: a plastic bag, rooting medium, sharp knife or scissors, container, and rooting hormone.

Rooting hormone will help stimulate root development in cuttings. The cut ends of the cuttings should be moistened slightly and then dipped into rooting hormone with excess tapped-off gently. Make a small depression or hole in the medium and place cutting in the hole and pull the medium up to support the stem or leaf. Try not to rub off the rooting hormone.

Cuttings may be rooted in regular flower pots, boxes, or flats. Good results are obtained by using two pots, one about 2 inches in diameter and the other about 6–8 inches in diameter. The rooting medium is put into the larger pot. Plug the drainage hole of the small pot, and set it in the center of the larger one level with the edge. The small pot is filled with water that seeps into the rooting medium where the cuttings have been inserted.

The cuttings should begin to form roots in 3 to 4 weeks and then they can be repotted into individual pots. The time varies by the type of plant. It is best to take cuttings when the plants are actively growing.

Another method is to place cuttings in a small amount of rooting medium in a large, covered glass jar or terrarium. Cuttings root quickly in such a moist protected enclosure, which can also be obtained by creating a plastic tent shelter. Use a bent wire coat hanger or wooden sticks to hold an ordinary plastic bag well above the tops of the cuttings.

While many plants will root easily in water, those roots aren't high quality and will have trouble becoming established after they are transplanted into a container. The "soilless medium" provides good aeration, drainage, and moisture-holding characteristics while supporting the stem of the plant while roots develop.

Division

Division or separation is another easy and quick way to propagate plants that produce stems at their base. The

Leaf bud cutting of heartleaf philodendron (*Philodendron hederaceum*).

Leaf section cuttings of snake plant (*Dracaena trifasciata*).

Applying rooting hormone to cutting of Jade plant (*Crassula ovata*).

new plants are obtained immediately, and they maintain the same characteristics as the parent or stock plant. It is for this reason that division is a favorite method of the amateur gardener.

Some houseplants propagated by division are snake plant, Boston fern, cast-iron plant, African violet, English ivy, philodendron, and vinca vine. Plants can be divided at any time, although doing so in the dormant or rest period is best.

To divide a plant, first remove it from the container. Then separate the stock plant into smaller pieces with a knife or your fingers. Each division should have some roots. Pot them in a sterilized mixture of one part sand, two parts peat moss, and two parts loam soil. Divisions without roots may be rooted as stem tip cuttings, as described above.

Two-pot method of rooting cuttings of Jade plant (*Crassula ovata*).

FAQs About Houseplants in Maine

People frequently seek the advice of UMaine horticulture extension personnel about the care of certain common but persnickety plants. We've collected answers to some of the most frequently asked questions here.

- What's wrong with my spider plant?
- How should I care for a poinsettia after Christmas?
- Why isn't my Christmas cactus flowering?
- Why isn't my African violet flowering?
- How Should I Care for an Air Plant?
- How Can I Use Moss with House Plants?
- Should I Fill the Bottom of My Pot with Stones for Drainage?

What's wrong with my spider plant?

Plant enthusiasts and even professionals who grow spider plants (*Chlorophytum comosum*) frequently ask two questions: "Why don't I get baby spider plants or runners developing from the original plant?" and "What causes the leaf tips to burn?" Spider plants need short day length (8 hours) to produce flower stalks (the runner on which plantlets form). The flowers are inconspicuous and open only during the day. After flowering, the plantlets develop. By having lights on in the evenings (thus increasing the day length during the winter months), the development of flowering stalks and ultimately the plantlets is inhibited and the plant produces an excessive amount of vegetative leaf growth. The plant must also be mature before it will produce runners (having it root-bound can sometimes help).

There are several causes of leaf-tip burn. When fertilizing, use a formula higher in phosphorus than nitrogen or potassium (use a 1 – 2 -1 or 5 – 10 – 5 fertilizer ratio). Improper watering and too much fertilizer can cause a soluble salts buildup in the soil. Never allow the plant to dry out excessively. Stick your finger into the pot and if it is dry down an inch or more you need to water. Another way is to lift the pot to see how light or heavy it feels. And a third way is if the leaves start to wilt, a sure sign it needs more water.

When you do water, water thoroughly from the surface, allowing plenty of water to drain out. Minute amounts of fluoride added to public drinking water can also cause tip burn. Keep the soil pH up around 6.3–6.5 to increase the amount of calcium in the soil available to the plant and to decrease the fluoride availability. Small amounts of lime can be used to increase the pH of the soil.

Spider plant.

How should I care for a poinsettia after Christmas?

With a little bit of special treatment, you can keep your poinsettia (*Euphorbia pulcherrima*) and bring it into flower again for next Christmas.

As the flowers pass maturity, the leaves and bracts (the colored leaves that serve as the "flower" on a poinsettia) will fall. When about half of them have fallen off, gradually reduce the amount of water you give the plant until the soil is completely dry. The plant is now in a state of dormancy and can be stored in the basement or a dark room at 50°F without watering for the winter.

Spring and Summer Care

When new shoots begin to grow on the old stems, move into the light, and start to water again. Cut back the stems to approximately 4 inches and repot the plant in fresh, clean soil. This soil should be porous to allow free drainage and to avoid waterlogging. (You will notice that there are usually three to four separate plants that make up one poinsettia plant). Leave a space of 0.5–1 inch between the top of the soil and the rim of the pot for watering. If the night temperature outdoors still falls below 50°F, keep the plant indoors in a sunny position.

When the danger of late spring frost has passed, prepare to plunge the poinsettia pot into the ground in your garden, in a place that receives full sunlight all day. First, line the bottom of the hole with an inch or two of gravel, to ensure the pot does not stand in a puddle of water. Then place the pot in the hole and fill it with soil to the top of the pot. Turn the poinsettia pot regularly to prevent rooting through the bottom holes; a quarter turn each week should accomplish this, and will also help to keep the plant growth even all around the pot. If the pot is not turned, one side may get more sun than the other.

Summer Care

Pinching: If you prefer a short plant with many flowers, pinch out the growing shoots to encourage branching. This should be done at 3–4 week intervals, according to speed of growth. Remove the top 0.25 inch by hand or with a clean, sharp knife. Two large fully expanded leaves should be left below the pinch; this serves as a guide for knowing when the shoots are ready for pinching. Continue this way until mid-August, when the plant should have a satisfactory shape and number of shoots. For a tall Christmas poinsettia plant, do not pinch the shoots.

Fertilizer: Give a soluble complete fertilizer (for example, 20-20-20), "meaning 20% nitrogen (N), 20% phosphorus (P), and 20% potassium (K)" once each month at the rate recommended by the manufacturer.

Drawing of Poinsettia with new shoots.

Disease and Pest Control—Outdoors, your poinsettia will be exposed to a number of garden diseases and pests. Spray it regularly to prevent damage and subsequent death of the plant. A spray containing both insecticide and fungicide can be used on your poinsettia. Read and follow manufacturer's directions.

Fall Care

At about the end of August, bring the plant indoors. Spray well for pests and diseases beforehand because all plant pests and disease organisms will multiply more quickly indoors or in a greenhouse and will invade any other growing plants. Place the poinsettia in a sunny position at room temperature.

Flowering is photo-periodically induced in the poinsettia. This means that flowers begin to form when the nights are long enough. Poinsettia is a short-day or long-night plant. Flower initiation begins about early October or late September. Because flower initiation depends upon the length of the dark period, your poinsettia must be kept completely dark from 5 p.m. to 8 a.m.

The time to give this treatment is from the end of September until December 15. Once you can see the flowers developing on the growing plants—that is, when the floral bracts start to show definite color—it is not as important to continue giving the dark period, though it is advisable to continue until the bracts are almost fully expanded. If at all possible, do not spray the plant with chemicals after the bracts begin to develop color.

Temperatures should be no less than 60°F, but not more than 70°F at night. During the day, give the plant as much sunlight as possible. Reduce the amount of fertilizer given by bringing the plant indoors. Growth is slower in the lower light intensity inside the house so the plant will need to be fertilized less frequently.

Why isn't my Christmas cactus flowering?

To bloom, Christmas cacti (*Schlumbergera bridgesii*) require bright, indirect light or filtered light and enough moisture that the potting material does not dry out. However, plants can be too wet as well as too dry. To prevent buildup of mineral and soluble salts, it is best to water with rainwater, distilled water, or melted snow at room temperature. If using rainwater isn't possible, the plant can be repotted in new, clean organic soil once a year.[1]

We need to understand the conditions Christmas cacti need to rebloom each year. Much like a poinsettia, the Christmas cactus requires certain light and dark periods in late fall to bloom. Cool nighttime temperatures (about 50–55°F) and warmer daytime temperatures (65°F) in October and November, along with 14 hours of uninterrupted darkness and bright light for the remaining 10 hours will initiate bud formation by December. This is why Christmas cacti in offices seem to have no problem blooming, but those kept in homes struggle to bloom.

It is easy to confuse Christmas cacti with Thanksgiving cacti (*Schlumbergera truncata*) and Easter cacti (Rhipsalidopsis gaetneri). The difference is in the shape of the leaves and the time of bloom. The leaf segments, botanically termed "phylloclades," are serrated or "toothed" on Thanksgiving cacti as compared to the more rounded leaf margins of Christmas cacti. Easter cacti bloom, of course, in spring, and have leaf margins with small bristles. Easter cactus leaves are more three-dimensional than on the other two cacti, have a thick ridge on one side, and the flowers are more star-shaped.

Thanksgiving cacti[2] need to start 12–14 hours of darkness in mid-September to bloom around Thanksgiving. Easter cacti need to start 14–16 hours of darkness the first of January to set buds so the plant can bloom near Easter. These plants can otherwise be treated as Christmas cacti are.

Why isn't my African violet flowering?

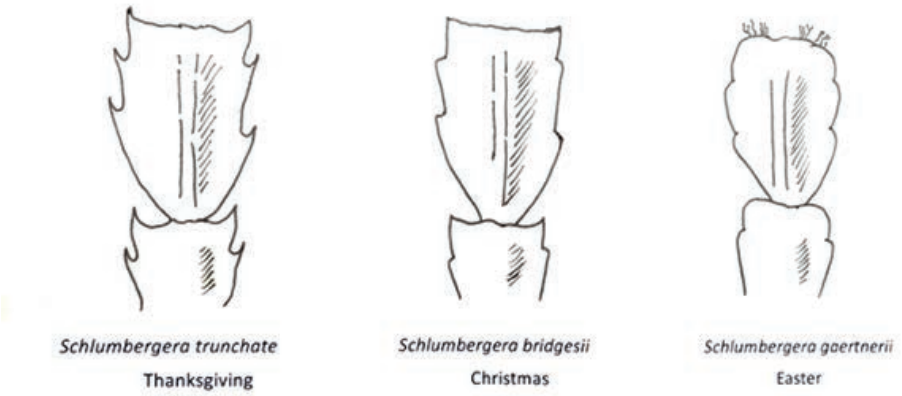
To keep your African violet (Saintpaulia ionantha) flowering year-round, it's all about balance.

Light: Although lack of light may be the reason your African violet isn't blooming, you don't need to put them in your brightest southern-facing window. African violets prefer bright, indirect sun, like a sunny east or west window. Excessive light can burn leaves. The use of sheer curtains in a sunny window can help diffuse intense light. They also need at least 8 hours of dark to trigger blooming, so if you use supplemental lights, limit their run-time to 16 hours or less a day.

Water: African violets prefer soil that is evenly moist at all times. Both excessively dry and wet soil can damage the root system, which can delay or prevent flowering.

Nutrients: Fertilizing regularly can ensure your African violet has the nutrients it needs to flower. Use either a fertilizer specifically for African violets or any complete balanced fertilizer (containing equal amounts of nitrogen, phosphorus, and potassium). Avoid fertilizers that contain urea, which can burn sensitive roots. Be

Christmas cacti (*Schlumbergera bridgesii*).



Comparison of Thanksgiving cactus, Christmas cactus, and Easter cactus foliage.

cautious not to over-apply nitrogen, which can cause the plant to focus on new leaf growth at the expense of flowering.

Pot size: A snug pot will encourage flowering. African violets that have been recently repotted or potted into too large of a pot may not flower. Too large of a pot may also retain too much moisture and lead to root rot. You can repot plants into the same pot with fresh soil once a year, when lower leaves drop too fast, and/or when soil becomes depleted.[3]

Temperature and Humidity: African violets are sensitive to temperatures below 60°F, and they prefer humid conditions, although they can survive at the typical humidity levels found in homes.[4]

Homes heated with wood heat can be especially dry. African violets and other houseplants can be grouped together to increase the humidity around the plants. Also, placing the African violet pot on top of stones in a tray of water will also increase humidity.

How can I get my *Phalaenopsis* orchid to rebloom?

Whether you received one as a gift or couldn't resist purchasing one for yourself, you may be wondering what to do with your Phalaenopsis orchid now that it's done flowering. Start by removing the old flower stalk at the base. Now that it has finished blooming, it's also a good time to repot it. Healthy orchid roots will be greenish-white. Cut off any dead or dried-out roots. You can repot it in the same pot or, if you choose to use a larger one, size up by no more than an inch or two. Specially designed orchid pots have holes in the sides to provide airflow, which will prevent root rot. You can also use unglazed terracotta.[5]

Next prepare your potting medium by mixing equal parts of sphagnum moss and orchid potting mix, which should have bark in it. Because these orchids are epiphytic—meaning they grow in trees—this mix more closely mimics their natural growing conditions than your standard soilless potting mixes.[6] Presoak your mixture and then squeeze out any excess water before repotting the orchid.

To ensure your orchid reblooms, provide bright indirect light, such as in an east window. Bud formation is triggered by the shorter days and cooler nights of fall. Providing nighttime temperatures of 55°F, like in a cool window, will help trigger bud formation, but be cautious because extreme changes in temperature could result in bud drop. Orchids also appreciate high humidity like African violets, regular fertilizing during the active growing season, and being repotted in fresh growing medium yearly.

How Should I Care for an Air Plant?

Air plants are in the Tillandsia genus of the bromeliad family that are native to tropical and subtropical climates. These epiphytic plants cling to tree trunks and branches or nonliving structures such as rocks or buildings. They don't need soil to sustain them because they have special cells in their leaves that absorb moisture from air or rain.

They can be grown indoors in bright, indirect light. Because they don't need soil and our homes are a much drier environment than a tropical forest, providing consistent moisture is a challenge. Spraying or misting on a regular basis is not enough. Air plants should be submerged in room-temperature water for 20 minutes and drained upside down for 30 minutes or shaken so water doesn't accumulate in the leaves. If you are on a

African violet.

Phalaenopsis orchid.

Broom Forkmoss (*Dicranum scoparium*).

Kokedama ready to hang by Trisha Smith.

public water supply, allow the water to sit overnight to reach room temperature and to allow the chlorine to dissipate before submerging your air plant. Generally plan to water weekly when plants are in bright locations or every two weeks when in cooler, darker locations.

Every third or fourth time that they are watered, a half- or quarter-strength of the manufacturer recommendation of soluble balanced fertilizer can be used. Air plants can be set outside during summer when the danger of frost has passed, but must be brought back in before frost in the fall. Air plants can bloom, but as with all bromeliads, they die after flowering. New offsets (or pups) form to replace the original plant before the bloom.[7]

How Can I Use Moss with House Plants?

Using moss in a horticulture project is not new. Moss has been used to line hanging baskets, cover soil in potted plants or terrariums, or in plant balls or Kokedama (Japanese moss ball string gardens.) Gardeners can either harvest their own moss (with the property owner's permission) or buy fresh, dry, or preserved moss.

Forest mosses[8] can be collected from rotting logs, rocks, or the forest floor. Sheet moss are the most commonly gathered moss because they can be easily peeled in loose sheets from rocks or logs.

Mosses are likely to be found in moist low areas near streams and rivers that have a large number of fallen trees and rocks. Mosses reproduce with tiny seedlike spores that are in small pockets on stalks that turn yellow, orange, red, or brown as they mature. When harvesting, leave behind patches with many capsules so these spores can "reseed" the area. Most regrowth comes from the fragments that are left behind.

Mosses regrow slowly, between 0.25 and 2.5 inches each year. Recovery is slowest (about 20 years) when all the moss is removed from a log or rock. But recovery can happen more quickly (about 10 years) when only a third to a half of the sheet moss is left behind in patches.

Moss harvesting is easiest when done after a heavy rain so the moss is fully hydrated. Freshly harvested moss can be used immediately for your craft projects. You can gently shake out the mosses to remove excess soil and leaves. Care must be taken to be sure the mosses are not exposed to excess heat or light and are kept moist. Sheet moss can be dried to keep longer.

To keep moss alive and growing, it must be placed out of direct sunlight and kept evenly moist by watering regularly.

To make a Kokedama,[9] start with a well-rooted cutting or root-bound houseplant. The best plants are those that can tolerate dry conditions. You can use potting soil mixed with bonsai soil or kitty litter to form a ball and pack around the roots and then wrap with moistened sheet moss and secure with twine. You can display your Kokedama on a tray, saucer, or other interesting vessel. Some enthusiasts cover their plant with a cloche to conserve moisture. They can also be hung from twine. Misting can keep the moss in good shape, but occasionally submerging the entire ball in a bowl of water to rehydrate the soil and moss is also done.

Should I Fill the Bottom of My Pot with Stones for Drainage?

It seems to make perfect sense—to improve drainage, why not add gravel or stones to the bottom of your pot? Thanks to soil scientists, we know that this may not have the intended effect. When moving down through soil, water cannot easily move from a layer of finer soil to a distinct layer of coarse soil. In fact, the water will fill up the pore space in the finer top layer before water begins moving down through the coarse layer, resulting in what is known as a perched water table. This can have the unintended consequence of moving the saturated zone up higher, resulting in roots staying wet longer.[10] To ensure soil is adequately well-drained, use only containers with proper drainage holes and make sure your potting medium is well mixed and contains coarser materials such as sand, perlite, or bark. Avoid placing plants in pots that are too large, because this can cause the medium to stay wet longer, resulting in root rot.

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