

How to Propagate Indoor Plants

When propagating plants, there's really no mysterious formula for success. Seeds, air layering, cuttings are just a few of the techniques used to multiply plants. There are rewards to propagating your own plants beyond the enjoyment of watching them grow. As all good gardeners know, extra plants mean swapping material. A few extra pots of your prized begonia could be swapped for those other plants you just have to have.

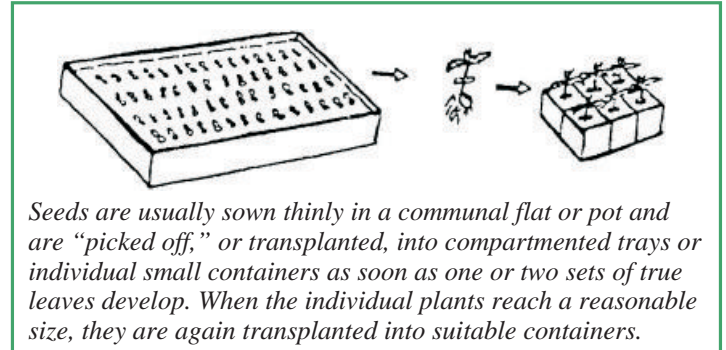
Before you start out, you need to know a little about the plant you intent to propagate. Certain plants can be propagated by more than one method, while others have a preference for only one.

Seeds

The wonders of sowing seeds are probably best witnessed by a young child that plants a marigold or zinnia seed in a small cup. Within days, the seedling emerges and from that point on, the child is hooked. There's the child in all of us when it comes to sowing seeds!

Seed catalogs and packets hold a wealth of information for the grower. Study the seed packet for days to germination, days to harvest. The seed packet will also tell you if the plant is: a hybrid, resistant to any fungal problems, etc. Save the seed packet and add it to your garden diary or journal.

Many people save their own seeds from season to season. There are pluses and minuses to this. Seed needs to be dry before storing and kept in a cold location. Seed that has not been properly dried can rot so check before sowing. Also, plants from seed do not always, "come true." If you want a duplicate of the parent plant, propagation by cuttings, division or air layering would be the preferred techniques. If you are looking for a quantity of plants, seed sowing has its advantages.



Seeds are usually sown thinly in a communal flat or pot and are "picked off," or transplanted, into compartmented trays or individual small containers as soon as one or two sets of true leaves develop. When the individual plants reach a reasonable size, they are again transplanted into suitable containers.

Seeds are commonly grown in shallow pots or seed trays or flats. Years ago, flats were made of wood. Today, flats are plastic. These plastic seed trays are made of a number of small compartments in which a single seed is sown. These small seedlings are called 'plugs'. A visit to a local garden center can provide ready-to-use trays filled with a seed starting mix.

Here's how to propagate seeds:

- ❖ **Always start with clean pots, flats or trays.** Soak used pots or flats in a solution of one part bleach to nine parts water. Rinse thoroughly in clean water and let dry before use. Stubborn dirt and residue can be cleaned with a wire brush.
- ❖ **Always start with a sterile rooting medium.** It is best to not use garden soil in the rooting mixture. To make your own rooting mixture use: ½ coarse sand or perlite and ½ peat moss or milled sphagnum. Fill the tray or pot with this mixture. A commercially prepared seed starting mixture should be available at your local garden center. Water the mixture before sowing seeds.
- ❖ **Check seeds before you sow; any that show signs of rotting should be discarded.** Damping-off disease is the biggest danger in propagating plants from seeds. The rooting mixture should be moist, not soggy. When using flats, scatter the seed thinly over the surface or sow in rows. Plug trays should have the seed placed over the holes.

Drawings: Cornell Cooperative Extension

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After sowing, the seeds should be covered with a light screening of sphagnum or peat moss. A mist spray of water dampens the surface material sufficiently without washing the seeds away.

❖ **Seeds will do best when a 'greenhouse' environment is created.** Do this to prevent drying of the seed starting mixture and young seedlings. A piece of plastic can be placed over the top of the tray or pot. Another way to create this environment, place the tray or pot in a clear plastic bag. Breathe into the bag to create 'a tent' and secure with a plastic tie or rubber band. Do not place covered flats in sunlight; temperature build up may cook the seeds or emerging seedlings. Remove the covering when the seeds have germinated.

❖ **After the seedlings have emerged, fertilize with a weak liquid fertilizer solution.** Use a quarter of the amount specified on the fertilizer label. Apply this solution carefully to avoid washing away the small seedlings. A rosette on the end of a watering can or small bulb syringe works well. Watering pots or porous flats from the bottom is another method of preventing seedlings from washing away.

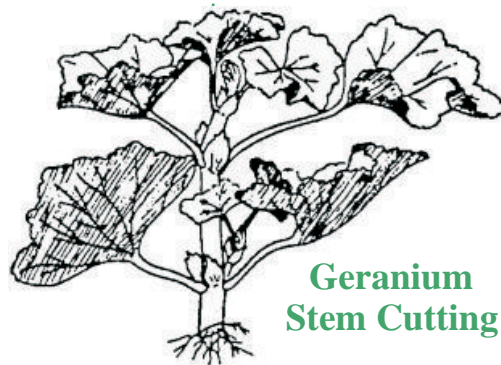
❖ When seedlings have developed two true leaves, it's time to **transplant or prick off to individual small peat or pottery pots.** A sterilized potting mixture should be used for most plants. Commercially prepared mixes are available. To make your own use equal parts of sand, sterilized soil, and peat. Soil less mixes of 1/3 peat, 1/3 vermiculite and 1/3 sand or perlite can also be used.

❖ **Cacti should be grown in a soil mix that drains readily.** To make your own, use two parts of sand or perlite to one part peat and one part soil. Cacti seedlings will benefit from a weak solution of liquid houseplant fertilizer to encourage growth. They should be placed directly in a south window in all but the hot summer months. During the summer, the seedlings should be in indirect light rather than full sun. When the seedlings have attained a fair, compact size, they should be transplanted to small regular containers and grown on to an appropriate size.

Cuttings

For many plant lovers, the most common method of acquiring new plants is by means of cuttings. Many people call them 'slips'. There are various types of cuttings. The name and description for the various techniques follows.

Stem cutting types



Terminal cuttings are simply growing tips of a plant that are snipped or pinched off from the parent plant. They contain a stem and several leaves; essentially a plant minus its roots. Coleus, geranium, ivy, and philodendron are examples of plants that are commonly propagated by terminal cuttings.

Long stems can be cut into sections called **sectional cuttings**. These cuttings can be several inches or more in length and contain two or more nodes with leaves but minus the terminal growing point. They are treated the same as a terminal cutting because the dormant bud in the axil of the leaf grows to establish a new terminal growing point.

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❖ To root, dip the cut end of a stem cutting into a rooting hormone powder and plant the stem in a pot of rooting mix until roots form. Some people will root these cuttings directly in water. Be advised, roots form slowly in winter months and overwatering may cause the roots to rot before they root. Even if roots do form, they are water roots that may not transplant well due to their brittle nature.

❖ Succulent or fleshy cut stems should be allowed to callous before planting.

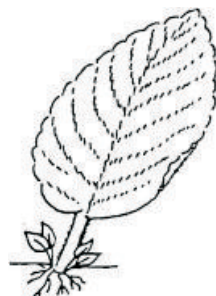
❖ Leave the cutting on the counter for a few days, then pot. A good rooting mix is ½ sand or perlite and ½ peat or ground sphagnum moss. Roots are well formed when there is adequate resistance, as evidenced by the fact that the slip does not pull out of the rooting mix easily. The rooted cutting can be potted up in a good growing mix. Examples of this would include succulents like Aloe.

Leaf-petiole cuttings

The leaf, plus its stem or petiole, is used for starting African violets, iron cross begonias, and peperomias.

Two different techniques are used. African violets and peperomias are propagated by inserting the petiole in the rooting mix with the leaf standing upright above the surface of the mix. Many leaves can be planted close together in a somewhat shingled effect. The rex begonia petiole is inserted in the rooting medium with the leaf itself pinned flat on the surface.

Small slits are made across the main veins of the leaf. New plants are made from these slits.



African violet
Leaf-petiole cutting

Leaf sections

Sansevieria and certain begonias like iron cross and rex, can be reproduced from leaf sections:

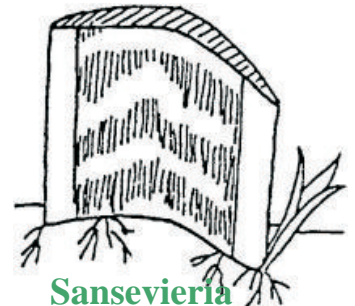
❖ Sansevieria leaves are simply cut crosswise into pieces 3-4 inches long and set upright in the rooting medium.

❖ Care should be taken to ensure that the pieces are right end up because they will not root upside down. Make a small identifying notch at the top so you know which end is up!

❖ With begonias such as the iron cross begonia, leaves are cut in radial sections on either the petiole or leaf stem. Each section is set upright in the rooting medium with the stem end inserted in the medium.

❖ Use a wooden plant label or matchstick behind the leaf for support.

❖ These plants will root better if a greenhouse environment is created; place a glass jar over the leaf section to maintain a moist atmosphere.



Sansevieria
Leaf-segment cutting



Rex begonia
Entire leaf placed flat on rooting medium

Entire-leaf cutting

Sedums, echevaria, and other fleshy leaved plants are



Echeveria
Entire-leaf cutting

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propagated by inserting the base of the leaf into the rooting mechanism. New plants develop at the base of the leaf.



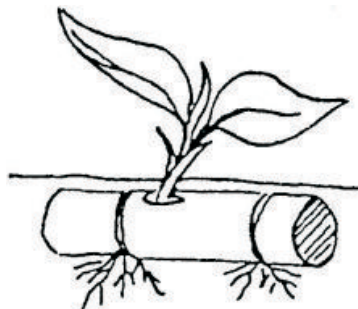
Philodendron
Leaf-bud cutting

Leaf-bud cuttings

A plant stem is cut into sections containing a single leaf and a piece of the main stem, including the node from which that leaf grows. Place the stem in the soil horizontally allowing the roots to form at the node. Philodendron and ivy are typically propagated this way.

Cane cuttings

Dracaena, dieffenbachia, and aglaonema, develop long stalks or canes as they naturally shed their lower bottom leaves. These bare canes show the rings or leaf scars where each leaf had previously been attached. Between every two rings or leaf scars is a dormant, sleeping bud.



Dieffenbachia
Cane cutting

❖ Cut the canes into sections with at least two leaf scars and a dormant bud or 'eye' present.

❖ The cane section should be laid horizontally just slightly under the surface of the rooting medium with the dormant eye facing upward at surface level. Roots develop at the ends of the canes. The leaf scars and the eye break dormancy, sprout, and form a new plant.

❖ A tall cane can produce many new plants. The growing top of the plant can also be rerooted. Propagate as a terminal cutting or by air layering before the cane is cut off. Usually, the bottom of the plant with the roots intact also resprouts.

Air layering

Woody-stemmed plants such as cotton, rubber plants, schefflera, fiddle-leaf fig, and laurel fig, which root more slowly, can be air layered. This is a good way to reduce the height of a plant that has outgrown its space and to obtain new plants.

❖ A notch is cut into the woody stem below the part to be removed.

❖ This cut is propped open with a matchstick or small twig. If possible, apply some rooting hormone to the open cut.

❖ This area should then be surrounded with a ball of moist sphagnum moss.

❖ Cover with a piece of clear plastic tied around the stem at the top and bottom of the moss ball. The moist sphagnum provides an ideal medium in which the roots can develop.

❖ When roots emerge from the ball and are visible through the plastic, the top can be severed below the root ball and planted. The lower stem can remain or be trimmed shorter. Eventually, dormant buds sprout from below the cut and a new terminal develops.



Rubber plant
Air layering

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Drawings: Cornell Cooperative Extension

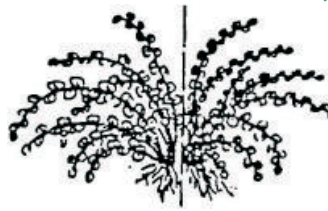
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Division

Plants may form multiple crowns. These crowns can be broken apart to form individual plants.

Sometimes these separated plants have few or no roots, so they should be planted in a rooting mixture until good roots develop. Other plants, such as ferns, asparagus fern, cast-iron plant, and prayer plant form dense clumps. These clumps can be cut with a sharp tool or pulled apart to form several smaller plants.

When dividing, the root ball must be broken apart, but the roots should be kept intact as much as possible. These divisions can be repotted in regular potting soil as individual plants.



Button fern
Division

Runners



Chlorophytum
Runner, plantlet,
small pot

A few plants send out runners that produce new plantlets.

Strawberry geranium or strawberry begonia; spider plant; and Boston fern; are good examples of plants that reproduce by runners. These plantlets can be removed and rooted as cuttings. An easier way to do this, allow the plantlets to remain attached to the mother plant, like an umbilical cord, with small pots set

alongside to accommodate the plantlets. When these plantlets have rooted firmly, the umbilical cord can be severed from the mother plant.

Offsets

Plants such as aloes, century plant, and hens and chickens, produce small plants on the short shoots at the base of the parent plant. These juvenile plants can be removed and potted as new plants.

Suckers

A secondary growth that originates from adventitious roots or rhizomes is called a "sucker." Bromeliads produce these small growths or 'pups' around the parent plant. Staghorn ferns also produce suckers. These suckers can be removed from the parent plant when they have developed into small-sized plantlets and potted as individual new plants.



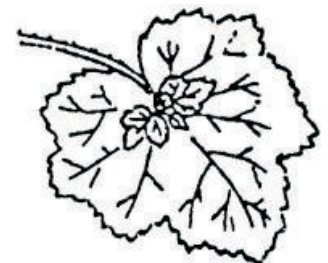
Bromeliad
Sucker plantlet

Plantlets and bulblets

Some plants produce plantlets of their leaves. Kalanchoe varieties produce tiny plantlets along the margin of the leaf. One such plant, bryophyllum, is commonly called "mother of millions" because of the many plantlets produced. Tolmiea, or piggy-back plant, produces plantlets on top of mature leaves.

Some ferns, like Asplenium bulbiferum, produce tiny bulblets that develop into tiny plantlets.

All of these aboveground plantlets produce new plants if they are carefully grown in a



Piggyback plant
Plantlet on leaf

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rooting medium. The leaf of the Bryophyllum (Kalanchoe) is fastened flat on the medium and the roots of the plantlets grow into it. In some cases, the young plantlets drop from the mother plant and readily root in the soil surrounding the plant.

The piggy pack plant leaf is treated like a leaf-petiole cutting and the fern fronds are usually left attached to the parent plant and pegged down flat on the propagating medium until the plantlets have rooted.



Bryophyllum
Plantlets on leaf

Bulbs, tubers, and rhizomes

Indoor plants such as amaryllis produce side bulbs that should be separated from the parent bulb when they reach a fair size.

Tubers are swollen underground roots or stems. Caladium, gloxinia, and tuberous begonia tubers are cut into sections after the new eyes have sprouted. Each section must contain a growing eye. All cut surfaces should callous or dry a day or two before repotting.

A rhizome is a thickened stem, usually underground but sometimes above ground. Rhizomes can be cut into sections and set level with the surface of the propagating medium like a cane cutting. When small plants develop, they can be lifted and potted in a good potting or growing medium.

Layering

One other method used for woody plants with large drooping branches or

vines is “layering.” This is a common method of propagating outdoor shrubs, but it can also be used for indoor plants such a gardenia, rubber plant, ivy, grape ivy and many others.

- ❖ A good candidate for this method is any vining or drooping branch that can be bent over and pegged down. The parent plant's pot or in another nearby container can be used.
- ❖ The stem area touching the soil should be bruised or scraped with a knife or nail file to induce rooting.
- ❖ A mound of soil is formed over the pegged-down stem.
- ❖ When roots have developed, the stem can be severed from the parent plant, and the new plant can be properly potted in a new container.

This does not produce many new plants, but it is a foolproof method of obtaining one or two.

Containers for propagation

Plants can be propagated using a variety of flats, pots, trays and boxes. Again, make sure the container is clean before using.



Forsythe pot
All-purpose
propagator

Drawings: Cornell Cooperative Extension

❖ If propagating several small cuttings, a Forsythe pot will give good results. This consists of a small porous clay pot, about 2-3 inches in diameter, set inside a larger clay pot, usually 6-8 inches in diameter.

❖ The rooting mixture is put in the larger pot. The small pot, with a cork or piece of gum to block the drainage hole, is set in the center of the larger pot, level

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with the rooting mixture.

❖ Cuttings and plantlets are inserted in the circular area of the rooting mixture and the small pot is filled with water, which seeps out into the rooting mixture and keeps it moist.

❖ Cuttings that are difficult to root have more success when rooted in a homemade propagating unit. To do this, cut and bend a wire coat hanger and arch it over a pot full of rooting mix. Water the mixture, insert the cutting and place a clear plastic bag over the pot. Use a rubber band to secure the bag to the pot.

❖ The humidity inside the bag is maintained at a high level and the leaves of the cutting remain turgid and un wilted. This method works especially for more woody-stemmed cuttings such as gardenia, bougainvillea, and ixora. Do not use it for cacti and other plants that may rot in a more humid atmosphere.

❖ A rooting hormone can increase success with woody or tough to propagate plants. To use, dip the end of the cutting in a rooting hormone, then insert into the rooting mixture.

A rewarding way to add plants to your garden, propagating is fun and easy. And if at first you don't succeed, don't give up! Always keep a journal. Be sure to record when you sowed seeds or took cuttings, rooting mixtures used, and any other horticultural practices.

About Your Expert

Donna Moramarco,
Horticulturist, a.k.a.

Donna ⁱⁿthe Garden

PlantAmerica Horticulturist Donna Moramarco (a.k.a. "Donna in the Garden") has been helping gardeners solve problems and achieve their dreams for over two decades. Donna has degrees in horticulture and education plus over 20 years as a Cornell University extension horticulturist.

Difficult-to-root cuttings can be rooted more easily in a homemade propagating case made by cutting and bending a wire coat hanger and arching it over a pot full of rooting mix. After the mix is well watered, the cutting is inserted, a clear plastic bag is placed over the pot, and a rubber band is used to fasten the plastic bag securely. The humidity inside the bag is maintained at a high level and the leaves of the cutting remain turgid and un wilted. This method works especially for more woody-stemmed cuttings such as gardenia, ardisia, cissus, bougainvillea and ixora. However, it is unsatisfactory for cacti and other plants that may rot in a more humid atmosphere.



Shopping List/Notes

A large yellow rectangular area with horizontal lines for writing, intended for a shopping list or notes.

Drawings: Cornell Cooperative Extension