

Propagating Herbaceous Plants from Cuttings

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Propagating Herbaceous Plants from Cuttings

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Plant propagation deals with the reproduction and increase of plants. This process occurs in two general ways—by seeds or spores, or through vegetative reproduction where a stem, leaf, or root is used to reproduce the plant. This publication deals with the vegetative reproduction of herbaceous plants from cuttings.

Herbaceous plants remain rather succulent and soft throughout their life, while woody plants develop hard stems. Many common house plants are herbaceous and can be reproduced readily from cuttings.

Herbaceous plants are most easily propagated in the spring when a natural increase in the rate of growth is occurring. They can, however, be propagated with equal success throughout the year as long as succulent plant tissue is available and you provide proper environmental conditions.

Cuttings are detached vegetative plant parts that can be expected to grow their missing portions to form complete new plants. Depending on the kind

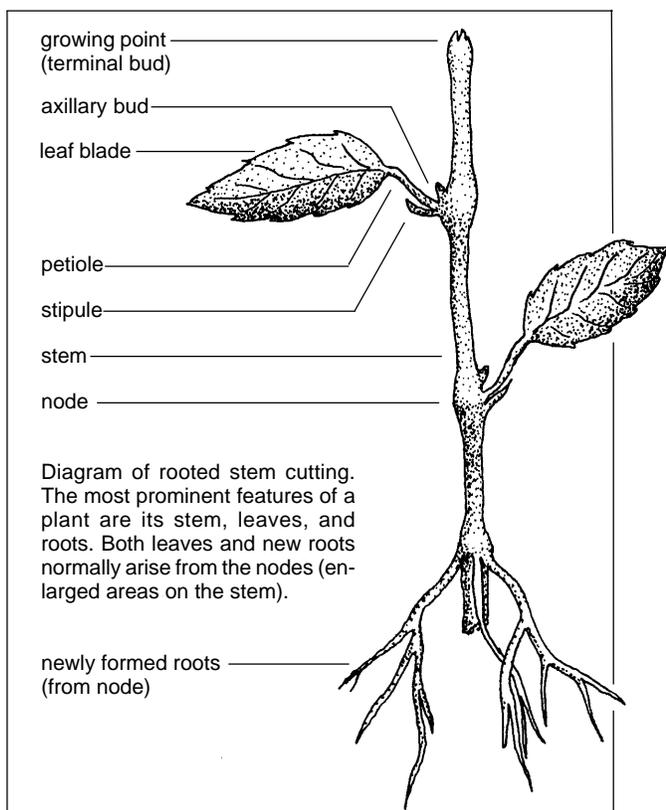
of plant, stems, leaves, roots, and leaves with a small portion of the stem attached can be used as cuttings. The table shows which portions to use for selected plants.

Types of Cuttings

Stem cuttings are one of the most frequently used forms of vegetative propagation. Use only healthy, vigorous, young tissue—older portions of herbaceous plants do not root as readily.

Remove from the parent plant a portion of stem 3 to 5 inches long with the leaves attached. Make a clean cut or break just below a node of the donor plant. Nodes contain actively dividing cells and are the areas where root formation is likely to occur most readily.

Snip off leaves and stipules (a modified leaf sometimes found at base of the leaf petiole, as with geraniums) from the bottom inch and a half of stem. They



Take cuttings below a node from a healthy, vigorous plant.

would be in contact with the rooting medium and would rot. The remaining leaves will continue to produce substances that aid in root formation on the cutting.

Apply rooting hormone to the base of the cutting. Then place the base of the cutting in firm contact with a moist, warm rooting medium. Some cuttings will root if you place them directly in water, whereas others will rot for lack of adequate air. After roots form, transplant the cutting to a permanent pot.

Cuttings of plants that exude a sticky sap—as geraniums and cacti—will do better if you allow the cut ends to dry a few hours before placing them in the rooting medium. This allows the wounded tissues to dry and helps prevent the entrance of disease organisms.

Some plants can be propagated from a single leaf. Generally, you can place the petiole of the leaf into the rooting medium just like the stem of a stem cutting.



Apply a small amount of rooting hormone to the cut surface of the cutting. (Excessive amounts of hormone may actually inhibit rooting.)



Make a furrow or hole in the rooting medium and insert the cutting. Then press the medium firmly about the cutting.

Roots and shoots form at the base of the petiole.

Place leaves of such plants as begonia, bryophyllum, and jade plant flat with their lower surface in firm contact with the rooting medium. Roots and shoots form from the leaf, which eventually decays.

Cut the swordlike leaves of sanseveria into cross sections. Place the base of each section in the rooting medium. In a similar way, cut leaves of many begonias into pie-shaped sections. Shoots and roots form from the basal end of the cutting.



Rooted cuttings ready for transplanting—coleus, carnation, geranium.

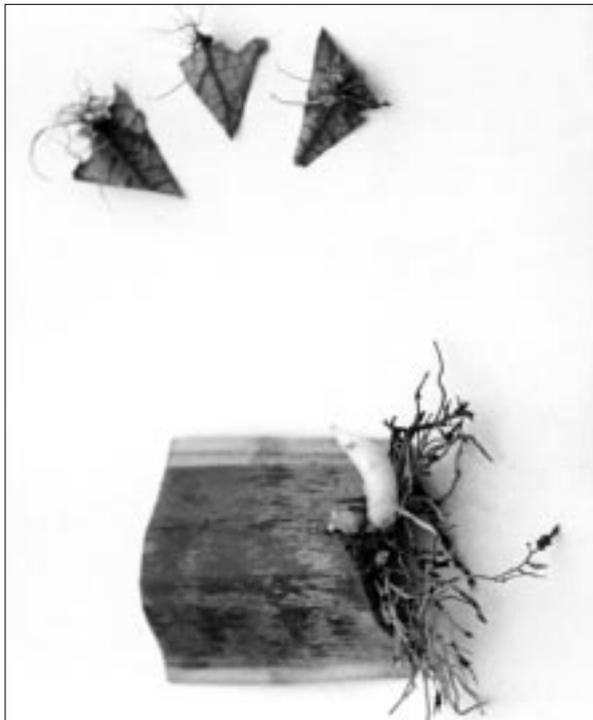


Leaf cuttings: peperomia leaf with roots formed from the petiole, bryophyllum leaf with new plants forming in the notches along leaf's edge, unrooted jade leaf.

Leaves of some plants form roots but will not produce new shoots. To propagate these, you must use a leaf-bud cutting, which includes the leaf plus an axillary bud and a portion of the stem. The shoots of the new plant will then form from the axillary bud.



Begonia leaf showing root formation from both the petiole and at cuts through the large veins on the underside.



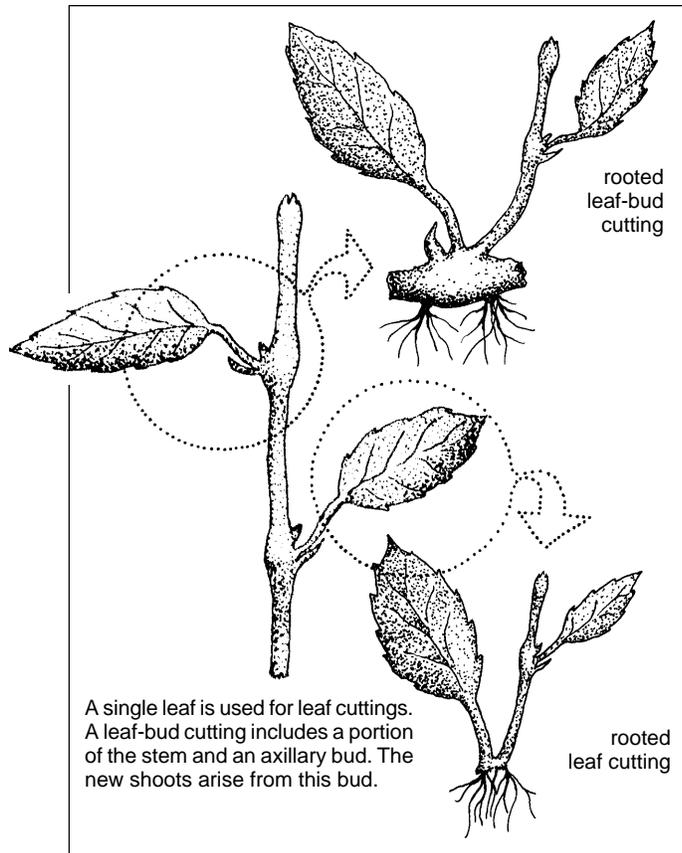
Leaf cuttings: rooted section of sanseveria leaf (bottom) with new shoot forming and rooted sections of begonia leaf (top).

Factors that Affect Rooting

Condition of Parent Plant. Use only vigorous, healthy plants as sources for cuttings. They should be free of both diseases and insects. Plants such as geranium can carry diseases that are not visible at the time the cuttings are taken. Always start with disease free stock.

Rooting Medium. Many types of media can be used for rooting cuttings. Cuttings might be rooted in water or moist sand, although these are not necessarily the best media to use. Regardless of the kind of medium, it should provide physical support, an adequate supply of oxygen and water to the root zone, and proper drainage. It should be loose enough that the plants can be transplanted without injury to the newly-formed roots.

The best medium for rooting cuttings combines two materials, one to provide water retention and the other to provide large pore spaces, which result in good aeration and drainage. Growers often mix sand with an equal amount of peat moss or sphagnum moss. You can substitute perlite and vermiculite, light-



weight inert substances, for sand. They provide a looser medium than sand and give better aeration.

Proper aeration in the area of root formation requires both a well-drained medium and proper watering. Although it is important to keep cuttings provided with water, do not allow the medium to become waterlogged. Make sure the container in which the cuttings are being rooted has drainage holes.

Water. Since leaves promote root formation, they generally are left on a stem cutting. However, plants lose water vapor through the leaves. Approximately 90% of the water a plant normally takes up is lost through transpiration. A cutting, however, has no root system to replace this water, and wilting or death of the cutting can result. Usually an intermittent mist system is used when cuttings are rooted commercially. The moisture lowers the leaf temperature and creates a humid atmosphere, reducing transpiration.

Most amateurs will not have a mist system available. However, you can obtain a similar effect by covering the propagation box with glass or plastic. This will keep the air humid, although the cooling effect will not be created. Do not expose the cuttings to direct sunlight because the temperature inside the enclosure will become too high.

Light. Light is important in rooting herbaceous cuttings. It is necessary for photosynthesis, which provides the energy to form the new tissues that become shoots and roots. However, unless you keep cuttings misted or the surrounding air cooled, keep them out of direct sunlight. Even if cooled, most thin-leaved

plants—like philodendrons and arrowhead plants—do best if they are never placed in direct sunlight.

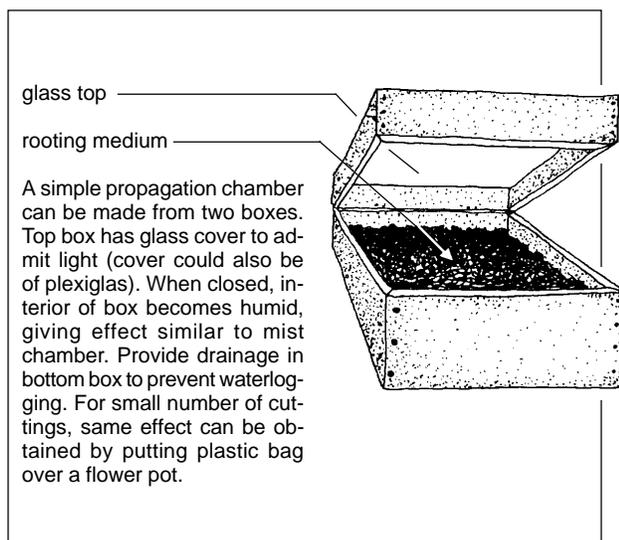
Temperature. For optimum rooting, maintain a temperature that encourages growth processes but does not cause excessive moisture loss and wilting. Most plants do best at about 60° to 65°F. Additional bottom heat, 5° to 10° higher than the air temperature, encourages rooting. Heating cables often are used beneath the rooting medium in the propagating bench to provide bottom heat.

Hormones. Use of plant auxins or growth hormones to encourage rooting has received considerable publicity. Auxins are compounds that occur naturally in the plant. Some have been synthetically produced and available to plant propagators since the late 1930s. They speed up and increase the rooting percentage of many hard-to-root plants, which helps ensure better rooting success. They also may shorten the time for rooting and enhance the quality and quantity of roots. Most herbaceous plants root readily without the addition of auxins, but their use is, nevertheless, often beneficial. Hormones aid rooting, they are not a substitute for good technique.

Napthaleneacetic acid (NAA) and indolebutyric acid (IBA) are the compounds most commonly used today to promote rooting of cuttings. Both are available as solutions or powders. The powders are the most practical for amateurs because they are diluted with talc to concentrations that will not be harmful to the cutting and because they are easy to use.

You can purchase the hormones at many garden stores. Some commercial brands offer formulations using different strengths of the active rooting hormone. Higher concentrations are for difficult-to-root plants or for plants having more woody stems. Read the label and use a hormone of proper strength for the type of cuttings you are propagating.

Spread a small amount of auxin compound on a piece of waxed paper or in a clean dish. Do not stick the cuttings into the whole container of hormone. If the cuttings happen to be carrying disease, the whole container can be contaminated. Dip the cut end of the cutting in the powder so that some adheres to the cutting. Make a hole in the rooting medium so that the powder is not scraped off when you insert the cutting. Discard leftover powder. Talc preparations lose their effectiveness after about 8 months even if kept in a closed container and refrigerated.



Selected Herbaceous Plants that Can Be Propagated from Cuttings

Plant		Type of Cutting	Approximate Time to Root (weeks)*
Common Name	Scientific Name		
African violet	<i>Saint-paulia</i> spp.	leaf	3-4
Aluminum plant	<i>Pilea</i> spp.	stem	2-3
Aloe	<i>Aloe</i> spp.	leaf	4-6
Aphelandra	<i>Aphelandra</i> sp.	stem	2-3
Arrowhead plant	<i>Syngonium albolineatum</i>	stem	2-3
Begonia	<i>Begonia</i> spp.	stem (fibrous rooted)	2
Cactus	<i>Cephalocereus senilis</i>	whole leaf or leaf section (Rex)	4-5
	<i>Opuntia microdasys</i>	stem	3-4
Chrysanthemum	<i>Chrysanthemum</i> spp.	stem	1-2
Carnation	<i>Dianthus</i> spp.	stem	2-3
Coleus	<i>Coleus blumei</i>	stem	1-2
Crown of Thorns	<i>Euphorbia splendens</i>	stem	4-5
Dahlia	<i>Dahlia</i> spp.	stem or leaf-bud	3-4
Dieffenbachia (dumbcane)	<i>Dieffenbachia</i> spp.	stem	4-6
Dracaena	<i>Dracaena</i> spp.	stem	3-4
Echeveria	<i>Echeveria</i> spp.	leaf or stem	4-6
Euphorbia	<i>Euphorbia</i> spp.	stem	4-6
Fittonia	<i>Fittonia</i> spp.	stem	2-3
Fuchsia	<i>Fuchsia</i> spp. (also hybrids)	stem	1-2
Geranium	<i>Pelargonium</i> spp.	stem	1-2
Hoya	<i>Hoya</i> spp.	stem	3-4
Hydrangea	<i>Hydrangea</i> spp.	stem	2-3
Impatiens	<i>Impatiens</i> spp.	stem	2-3
Ivy	several genera and species	stem	2-3
Jade	<i>Crassula</i> spp.	stem or leaf	4-5
Kalanchoe (bryophyllum)	<i>Kalanchoe</i> spp.	stem or leaf	4-5
Lantana	<i>Lantana</i> sp.	stem	3-4
Monstera (split-leaf philodendron)	<i>Monstera deliciosa</i>	stem	4-5
Mint	<i>Mentha</i> spp.	stem	2-3
Peperomia	<i>Peperomia</i> sp.	leaf, leaf-bud or stem	4-6
	<i>P. obtusifolia</i>	leaf-bud or stem works best	4-6
	<i>P. obtusifolia variegata</i>	leaf-bud or stem works best	4-6
Periwinkle (myrtle)	<i>Vinca</i> spp.	stem	3-4
Petunia	Petunia hybrids	stem	2-3
Philodendron	<i>Philodendron</i> spp.	stem	2-4
Piggyback plant	<i>Tolmiea menziesii</i>	leaf with plantlet	3-4
Pothos	<i>Scindapsus aureus</i>	stem	2-3
Poinsettia	<i>Euphorbia pulcherrima</i>	stem	2-3
Sanseveria (snake plant)	<i>Sanseveria</i> spp.	leaf, leaf section	4-6
Velvet plant	<i>Gynura</i> spp.	stem	1-2
Wandering Jew	<i>Tradescantia</i> spp.	stem	2-3
	<i>Zebrina</i> spp.		

*The indicated time for rooting is only approximate and may be longer under some conditions. Where new shoots must develop in addition to roots, the time required for shoot development is often longer.

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