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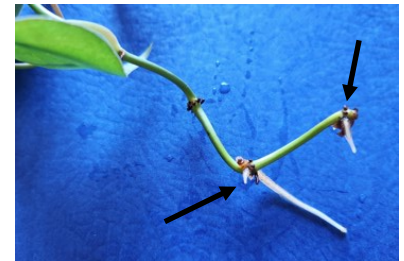
# Propagating Plants

Most gardeners have been given a plant shoot by a friend and then they rooted it to produce a new plant. The scientific term for this process is "asexual propagation". Asexual propagation includes growing plants using cuttings, air/tip layering, plant division, budding, grafting, and tissue culture. Each plant derived from asexual propagation means is genetically identical (a clone) to its mother plant. It should have the same leaf shape, flower/fruit characteristics, growth form, vigor, and so on, as the parent plant from which it was grown.

Most indoor plants are easily rooted in plain water and cacti and succulents in well-drained mineral soil. Woody plants can be more difficult to propagate. Depending on the species, you may have to research the timing and concentration of rooting compound to increase your chances of success. The four main types of stem cuttings are herbaceous, softwood, semi-hardwood, and hardwood. Leaf and root cuttings can also be used. These terms reflect the growth stage of the stock plant, which is one of the most important factors influencing whether cuttings will root.

For practical purposes, let's review some of the practices that will increase your success in rooting cuttings. Always take cuttings with a sharp, sanitized blade to reduce injury to the parent plant and minimize disease transmission. To sanitize, swish the cutting tool in rubbing alcohol for a few seconds. Remove flowers and flower buds from cuttings to allow the cutting to use its energy and stored carbohydrates for root and shoot formation rather than fruit and seed production.

Plants with fleshy stems, e.g. many houseplants, can easily be rooted in water. Leaves should be healthy, not limp or in need of water. Cut below a leaf node and remove any leaves that will be in water. Place stem in water. Roots will form at the nodes in the water (shown in photo). When roots have formed the stem may be planted in soil.



Philodendron—roots forming at nodes where leaves were removed.

When propagating woody plants, select cuttings from vigorous, healthy wood, preferably from the upper part of the plant. Avoid excessively vigorous shoots as well as weak, spindly growth. Once cuttings are made, they must be placed into a growth medium such as coarse sand, vermiculite, soil, water, or a mixture of peat and perlite. It is important to choose the correct rooting medium to get optimum rooting in the shortest time. In general, the rooting medium should be sterile, have little or no nitrogen fertilizer, drain well enough to provide oxygen, and retain enough moisture to prevent water stress.

To obtain more uniform rooting, you should consider using a rooting compound containing indole butyric acid (IBA) or naphthalene acetic acid (NAA). Prevent possible contamination of the entire supply of rooting hormone by putting some in a separate container for dipping cuttings. You can use a small plastic sandwich bag. A small container of rooting compound lasts a long time. The brand makes little difference and instructions for use are included on the container.

Moisten the medium before inserting cuttings and keep it evenly moist while cuttings are rooting and forming new shoots. Some plants root better in warm soil. Commercial operations often do this by heating the propagation beds. Tip cuttings are also commonly used in production nurseries. Here, a 2 to 6-inch piece of stem, including the terminal bud is cut off the mother plant just below a node. Remove lower leaves that would touch or be below the rooting medium. Dip the stem in rooting hormone. Gently tap the end of the cutting to remove excess hormone. Insert the cutting deeply enough into the media to support itself. At least one node must be below the surface.

Commercial producers propagate cuttings in greenhouses, but you can simply put a thin plastic bag (like those in the grocery store vegetable department) over the top of the pot to increase the humidity and place it in a bright location indoors. Once rooted, plant the cutting in a clean pot preferably filled with sterile potting mix. Grow rooted outdoor plants outdoors and indoor plants in a bright spot inside your house. If you are new at this, start out with geraniums, succulents, or cactus.

Air layering is another method that can be used in plant propagation. The stem is wounded and encased in moist sphagnum moss into which roots grow. Once an adequate root system has been produced, the rooted stem is cut from the parent plant.

Start with easy-to-root plants such as figs or grapes, then advance to more difficult species. There are many excellent publications and videos available on this topic. Have fun and share your plants with friends.

The following series of photos demonstrates the air layering process on an Oregon grape (*Mahonia aquifolium*) shrub. (Photos by Jeff Schalau, University of Arizona).



In wounding the stem, a 1/4" wide strip of bark was cut off (including the cambium) the applied rooting hormone (IBA) to the wounded area.



Damp sphagnum moss ready to wrap around the wounded, IBA treated stem.



Plastic wrapped these around the sphagnum, and ends sealed with



To keep light out and minimize heat build-up, the plastic was covered with aluminum foil and ends tied with nurse tie tape.



The entire plant is shown with arrows pointing to the air layered stems. Once plentiful roots form, each rooted shoot can be cut off and planted in a pot and placed in a protected location to grow more roots and become established before transplanting .

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