PROPAGATION OF PLANTS

(DEFINITION OF PLANT PROPAGATION)

Plant propagation as production of new plants from a selected plant having the characters of the original plant is called (cloning)

Hydrangeas (Do not take cuttings later than August or September

Fuchsia Can take cuttings anytime- Fuchsias are perennial but some are too tropical to survive our winters. So we treat them as annuals.

Woody herbs such as scented geraniums. Take cuttings end of Summer

(New cuttings should show roots in 6-8 weeks but some take 12 months)

MATERIALS NEEDED FOR CUTTINGS

Plant Cuttings
Potting mix such as sand, perlite, vermiculite, peat moss or sterilized light weight soil
Root tone
Cutting sheers
Disinfectant for cleaning tools, such as alcohol
Water
Plastic bags if you do not have a green house
Pea gravel for the bottom of plastic bag for the pots to set on
Pencil for making indention in the soil mix

PHOTO BY ROB WALLS/ALAMY

Hydrangeas respond well to several propagation techniques, including layering and dividing. But Dirr's method for rooting softwood cuttings in summer will yield a bunch of new plants in about four weeks.

To do it, locate a stem of softwood between the hard, woody growth at the bottom of the plant and the fleshy green tip by bending it; softwood should snap cleanly. Cut a softwood shoot that has several leaves. Trim it into 5-inch-long pieces that each have a leaf toward the top. Remove extra leaves; Dirr goes a step further and cuts the remaining leaf in half to minimize evaporation (and the need for watering). Dip the other end in powdered rooting hormone; plant the cuttings in trays filled with a soilless mix and perlite. Cover with a plastic bag, and stash in a shady location, misting regularly to keep the leaf hydrated. After four weeks, tug on it to check for roots; once roots are developed, transplant to a bigger pot and feed with a slow-release fertilizer. By next spring, cuttings will be ready to go in the ground.

How to Propagate Fuchsia Cuttings

Fuchsia cuttings can be taken anytime from spring through fall, with spring being the most ideal time. Cut or pinch out a young growing tip, about 2 to 4 inches in length, just above the second or third pair of leaves. Remove any bottom leaves and, if desired, you can apply rooting hormone [2], though it's not an absolute. You can then insert three or four cuttings in a 3-inch pot or numerous cuttings in a planting tray, into a moist growing medium like sand, perlite [3], vermiculite [4], peat moss [5], or sterilized soil [6]. It may help to make a hole in the growing medium with your finger or a pencil beforehand for easier insertion of the cuttings.

The cuttings can them be covered with ventilated plastic to retain moisture and humidity, but this too is not an absolute. However, it does speed up the rooting process. Place the cuttings in a warm location, such as a window sill or greenhouse.

Within three to four weeks (or less), the cuttings should begin establishing good roots. Once these roots start, you can remove the plastic covering during the day to acclimate the young plants. When they have started growing well, the rooted cuttings can be removed and repotted as needed.

In addition to placing cuttings in soil or other growing medium, you can also root them in a glass of water. Once the cuttings produce some well established roots, they can be repotted in soil.

"Cuttings Process"

Plant cutting, also known as striking or cloning, is a technique for vegetatively (asexually) propagating plants in which a piece of the source plant containing at least one stem cell is placed in a suitable medium such as moist soil, potting mix, coir or rock wool. The cutting produces new roots, stems, or both, and thus becomes a new plant independent of the parent.

Taking cuttings of geraniums:
First, prepare the soil and pots. We will use cuttings trays.
Next, locate some nice cuttings on your plants. Early spring is the best time to do it. Select succulent stems with green growth tips.
With a pencil, chopstick or similar object poke a hole in the soil where each cutting will go. The hole should be about 2 inches deep. Each 4 inch pot should have one hole. If you are using a tray, the holes should be about 4 inches apart.
Make cuttings about 4 inches long. Cut straight across with a sharp knife. If you cut on an angle, only part of the stem will root. A straight-across cut is necessary. It is extremely important to make the cutting at the joint of node. This is the only point where roots will form from. It is easy to tell where the node is on a geranium because you will see stem emerging from that area. Cut straight across that point
Do hold the plant out and swipe in the jaunty fashion that florists use in cutting the stem ends off of roses. The movement should be smooth and swift but not dangerous with knives and blades flashing about.
Strip the leaves (if there are any) off the bottom 1 1/2 inches of the cutting.
Dip each cutting in #1 rooting powder, available at all garden stores, some hardware stores, and a few florists.
Stick the cutting in the hole.
Immediately stick the cuttings into soil.
Using the pencil again, poke the hole closed so that the soil is firm around the base of the cutting and water the cutting
Place in a bright location, such as right next to a window.
In a few weeks your cuttings will be rooting -- but don't pull them out. That would wreck all that hard work.
You will tell when your cuttings have "taken" because they will start to grow. Feed them with all-purpose plant food.

"Asexual Reproduction"

Gardeners have learned to use the asexual reproduction of plants to their advantage and are now using artificial methods of vegetative propagation to increase the stock of a plant. Two ways in which this is done is via cuttings and grafting. These methods are considered to be artificial as they do not occur naturally.
Cuttings
Cuttings are the most common method of artificial vegetative propagation used as many plants can be produced from just one parent plant. In this method, cuttings may be taken mainly from the stems and roots of the parent plant. These cuttings must include a meristematic region from which growth (via mitosis) can occur. The cuttings, when placed in a suitable, for example, moist soil and under the right conditions (sufficient nutrients, water and sunlight), develop roots and shoots. The roots and shoots grow and develop into a plant identical to the parent plant from which the cuttings were taken.
This process is used to provide many plants from one single plant, each plant being exactly the same. It is beneficial to agricultural farmer as it is a quick, easy method to produce a vast number of crops. One such example where artificial vegetative propagation has been very beneficial is on a sugar cane plantation. The asexual reproduction of plants via cuttings is much faster and produces much more than sexual reproduction would.

Summer won?t last forever, and if you?re like me you have more containers of tender scented geraniums and other perennials than you have sunny window space inside. Do you shrug and tell yourself you?ll buy new ones next year? Do you scramble to build a greenhouse? No worries. Make room for a favorite or two, and take cuttings of everything else!

Propagating Pelargoniums (aka scented geraniums) from cuttings doesn't require tricky methods or complicated equipment. This easy method will work for most woody herbs or perennials, especially those whose growth habit makes layering difficult.

The end of summer is a great time to take cuttings. Growth slows down, and new stems have started to thicken up. It's best to take cuttings just a little further down than the new green growth, making your cut where the stem is "half hard," meaning a little thicker and a little stiffer and often a darker color. Strip off all but a few leaves at the top of the cutting, and re-cut the end with a sharp knife. Pinching back the tip will encourage the cutting to put its energy into making roots. Once the cutting "takes," the pinched top will branch out to start forming a bushy little plant.

Now you need some way of holding a little extra humidity around the cutting, to keep it from wilting before it roots. This can be anything from a propagation tray with a tall dome to a little zip-front plastic "greenhouse" if you're starting a lot of cuttings. If you just have a couple of pots, try topping each pot with a plastic bag propped up on a couple of chopsticks to keep the plastic away from the leaves. You don't want the cutting to touch the plastic, or condensation may lead to rot.

Sometimes cuttings will strike roots in just a few days; other times it may take several weeks. As long as the cutting looks green and crisp, just give it time! You can tell when roots have formed when a gentle tug on the cutting meets with resistance. If you tug too hard and pull the cutting right out, roots and all, don't worry. Just stick it back down into the pot and give it a splash of water to settle the soil back around the roots.

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Parts of a plant severed from a parent plant and rooted to form new plants are called *cuttings*. In this way new plants may be formed with the same characteristics as the parent plant. Rooting cuttings at home is simple and inexpensive and requires little labor and equipment.

Types of Cuttings

Cuttings of landscape plants are usually made from shoots or stems, but a few may be made from roots. Types of stem cuttings generally used for propagating woody plants are softwood, semi-hardwood and hardwood.

Softwood: Softwood cuttings are taken from new growth of the current season. They are used for propagating deciduous shrubs such as forsythia and lilac. They are generally the easiest to root and don't require special handling. The best months to take softwood cuttings of shrubs are June and July, although some may be taken in August.

Softwood cuttings are taken while stems are succulent and not yet woody, but mature enough to break when bent sharply. Avoid very young, tender shoots.

Semi-hardwood: Semi-hardwood cuttings are taken during late summer but are made from current season's growth that has partially matured and is becoming woody. These cuttings are used to propagate broad-leaved evergreens such as holly, euonymus and azalea. The term *semi-hardwood* is also sometimes applied to partially matured cuttings of deciduous plants.

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Hardwood: Hardwood cuttings may be taken from deciduous plants and narrow-leaved evergreens. Cuttings from these plants are taken during the late fall or early winter after a hard frost when the plants have become dormant.

Deciduous plants — Some plants suitable for hardwood cuttings are privet, willow, poplar, honeysuckle, grape and spirea. The length of these cuttings may vary from 4 to 24 inches, although most are made 8 to 10 inches long. Diameter may vary from 1/4 to 1 inch, depending on the type of material to be propagated.

Narrow-leaved evergreens — Most narrow-leaved evergreens are propagated by using hardwood cuttings. These plants include junipers (cedar) and yews.

The cuttings should be taken from terminal shoots of the previous season's growth and should contain a small portion of year-old wood at the base.

How to take cuttings

Select cuttings from vigorous, healthy wood, preferably from the upper part of the plant. Avoid excessively vigorous shoots as well as weak, spindly growth.

Softwood and semi-hardwood cuttings should be taken during cool portions of the day. Place the cuttings immediately in a plastic bag to avoid excessive wilting. Cuttings should be 4 to 6 inches long. A slanting cut slightly below a node will generally give best results. Use a sharp, clean knife.

Remove leaves from the lower half of softwood and semi-hardwood cuttings (see Figure 1). Dip the base of the cuttings in a rooting hormone for faster and better rooting. Rooting stimulants are generally available in most garden supply stores. Use as directed.

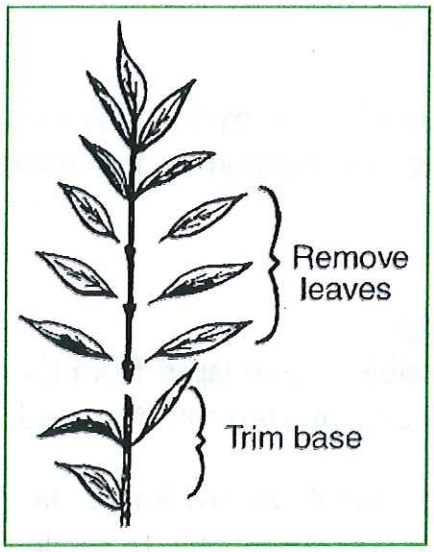

Figure 1. Trim cuttings and remove leaves from lower half of each cutting.

Rooting media

The medium used for rooting cuttings must be clean and sterile. Diseases are a frequent cause of poor rooting. They may come from containers, tools, workbench or rooting media that have not been sterilized.

The rooting medium should not contain fertilizer. Begin fertilizing after cuttings are rooted and have been transplanted to a growing medium.

Clean, coarse, construction-grade sand may be used for rooting cuttings. Avoid very fine sand because it has poor aeration, which retards root formation. A mixture of one-half sand and one-half peat moss is a better rooting medium.

Vermiculite, a lightweight expanded mica product, is suitable for rooting cuttings. The horticultural grade (No. 2) is the best size to use, and it may be used separately or mixed with an equal volume of sand.

Perlite is another excellent propagating material. It is lightweight and provides good aeration to the cutting. Perlite gives best results if mixed with an equal volume of peat moss or vermiculite.

Heavy soils should not be used for rooting. They tend to pack tightly, which results in poor aeration and little or no root formation. They also must be thoroughly sterilized to prevent

disease development.

Compressed peat pellets that expand when water is added make a convenient propagation medium and container.

Inserting the cutting

As little time as possible should lapse from the time the cuttings are taken until they are inserted into the medium.

The prepared cutting should be stuck into the medium up to the remaining leaves. Water thoroughly to settle the medium around the base of the cutting.

Care of cuttings

The propagation medium should never dry out during rooting. Also, avoid excessive watering, which results in poor aeration and death of new roots.

Since cuttings don't have a root system, high humidity must be maintained. Low humidity allows wilting, scorch, leaf drop or death.

Enclosures help maintain high humidity. If only a few cuttings are to be rooted, use a miniature greenhouse or place individual pots in large plastic bags (Figure 2). Monitor the plastic bags for condensate, and water the medium when condensate disappears. Never place plastic-enclosed containers in direct sunlight, because excessive heat will build up. For rooting large numbers of cuttings, use coldframes, hotbeds or greenhouses.

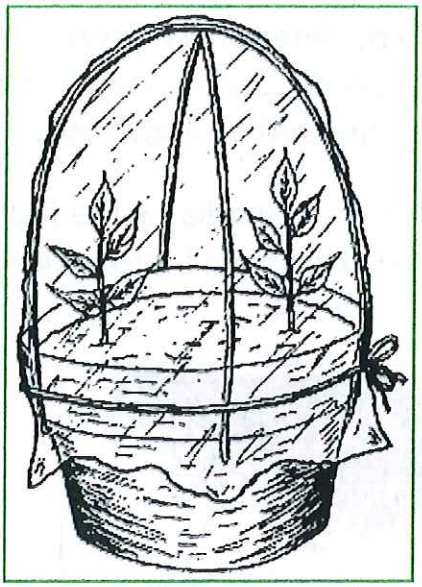

Figure 2. Miniature greenhouse constructed over a large flower pot for rooting a few cuttings.

Care of rooted cuttings

The time necessary to form roots differs greatly between plants. Most woody cuttings root in several weeks (forsythia), but hard-to-root cuttings (rhododendron) may take three to four months. Check cuttings occasionally by carefully removing a few from the medium. After cuttings have produced some roots at least 1 inch long, they are ready to be transplanted into a growing medium.

The move from high humidity and moist rooting medium to low humidity and dryer soil is critical. Do it carefully. Give these new plants close attention during the first weeks after the move.

If only a few cuttings have been rooted, pot them in individual containers. Larger quantities should be placed in a well-prepared but protected bed or coldframe outdoors where they can be given special care for two growing seasons.

Some plants such as azaleas and rhododendrons require special acid soil, but for most plants a mixture of equal parts good topsoil, sand and peat moss makes a good growing medium. Add about 1 cup of an all-purpose garden fertilizer (such as 12-12-12) and 2 cups of ground limestone to each bushel of mix. Thoroughly mix these into the medium before filling the containers. Potting soils for houseplants may be purchased and used for potting cuttings when no other soil is available.

If a nursery bed is used, thoroughly pulverize the soil, and work in 3 to 4 inches of compost, peat moss or leaf mold. Add fertilizer and lime as directed by a soil test.

Install some shade over cuttings during the first growing season. A shade screen can be made from burlap, snow fencing or laths (Figure 3).

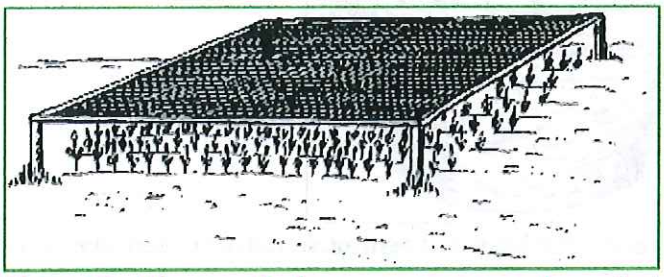

Figure 3. Place a shade screen over newly rooted cuttings outdoors.

Provide protection to young, rooted cuttings during the first winter season. Mulch them with straw or construct a coldframe around them. Coldframes may be made from concrete blocks or scrap lumber covered with clear plastic, burlap or cheese cloth. If plastic is used, remove it during warm days, or cover it with straw to prevent heat buildup.

After two growing seasons in the nursery bed or container, the young plants should be ready to move to permanent locations.

Table 1. Propagation techniques for common garden plants.

Plant	Cutting		
	Softwood	Semi-hardwood	Hardwood
Abelia	X	X	
Althea (Rose of Sharon)	X		X
Arborvitae		X	X
Azalea		X	
Barberry	X		X
Birch			
Bittersweet	X		X
Boxwood		X	
Butterfly bush	X		X
Clematis	X		
Cotoneaster	X		X

Crepe myrtle	X		
Deutzia	X		X
Dogwood	X		
Euonymus	X	X	X
Forsythia	X		X
Hawthorn	X		X
Holly		X	
Honeysuckle (bush)	X		X
Honeysuckle (vining)	X		X
Hydrangea	X		
Juniper			X
Kerria	X		X
Lilac	X		
Magnolia	X		X
Mahonia (grape holly)		X	
Mock orange	X		X
Poplars			X
Privet	X		X
Pyracantha		X	
Rhododendron		X	X
Rose	X		X
Spirea	X		X
Sweetshrub	X		X
Viburnum	X		X
Weigela	X		
Willows			X
Wisteria			X
Yew			X

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