



Unit E: Plant Propagation

Lesson 3: Propagating Plants by Cuttings

Terms

- Asexual propagation
- Growing medium
- Hardwood cuttings
- Herbaceous cuttings
- Leaf cutting
- Leaf-bud cutting
- Root cutting
- Semi-hardwood cuttings
- Softwood cuttings
- Stem cuttings

What Are the Reasons for Propagating Plants Asexually?

- Asexual reproduction in plants involves the reproduction of new plants using only the vegetative parts of the parent plant
 - These include the stems, leaves and roots
 - This is possible because many plants have the ability to regenerate not only the vegetative parts of the plant but also missing plant parts



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- Asexual propagation enables the production of plants that would otherwise be difficult or impossible because the plant does not produce viable seed or the seed is difficult to germinate
 - Asexual reproduction is also used when plants will not breed true to seed or when specific genetic forms of the plant are necessary

- This form of reproduction produces plants that are identical to the parent plant



- Asexual propagation may be faster than propagation by seed
 - Germination and growth of seedlings is often slow compared to propagation by cuttings
 - It may also be more economical to produce plants asexually and in many cases it is easier



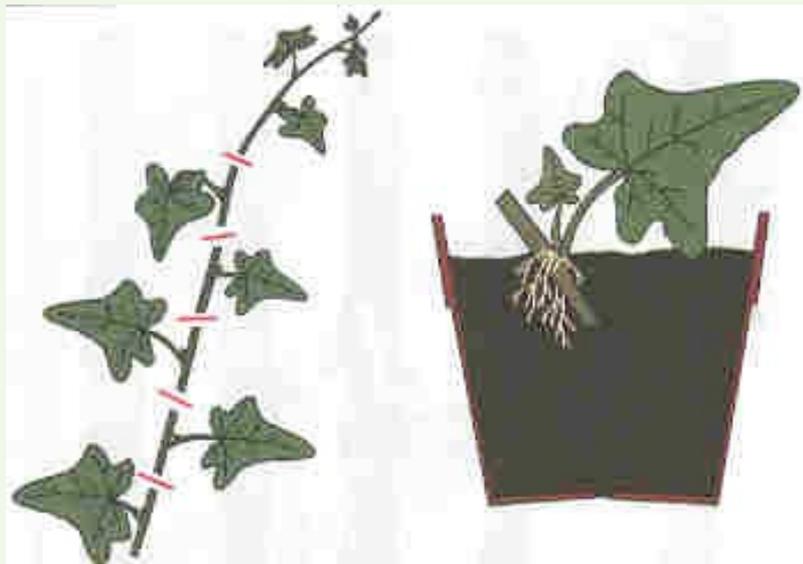
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What Are Leaf & Leaf-bud Cuttings & How Are They Used to Produce a New Plant?

- Entire leaves or portions of a leaf can be removed from the parent plant for use as a leaf cutting
 - A **leaf cutting** is a piece of a leaf blade, or a leaf blade with a petiole attached
 - They have the ability to reproduce new stems and roots from the edge of the leaf
 - After the roots develop to support the new plant, the old leaf dies



Courtesy of Interstate Publishers



– A ***leaf-bud cutting*** consists of a leaf blade, the petiole, and a short piece of stem with an attached bud

- The small bud will develop into a new plant stem that will eventually produce the new plant roots
- Example - English Ivy

Leaf Cuttings Continued

- Healthy leaves that have just reached maturity should be used for leaf cuttings
 - Some plants may be propagated using only the leaf blade or a section of the leaf
 - The leaf is cut from the parent plant and the cut edge placed on top of the rooting medium or inserted into the medium

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- New plants develop along the edges of the leaf
 - Example, *Sedum* or Jade
 - Some plants require that both the leaf blade and petiole be removed from the parent plant
 - These cuttings should be placed deep enough in the medium to keep the cutting upright
 - Examples, African violet or *Peperomia*
 - Leaf-bud cuttings are important to the propagator when there is limited plant material and many new plants are needed

- This type of cutting consists of a leaf blade, petiole and short piece of stem with an attached bud
- Leaf-bud cuttings should be made from healthy growing leaves and well developed buds
- The stem of the cutting is inserted into the growing medium with the bud just below the surface of the medium
- Examples, English ivy, Philodendron or Maple

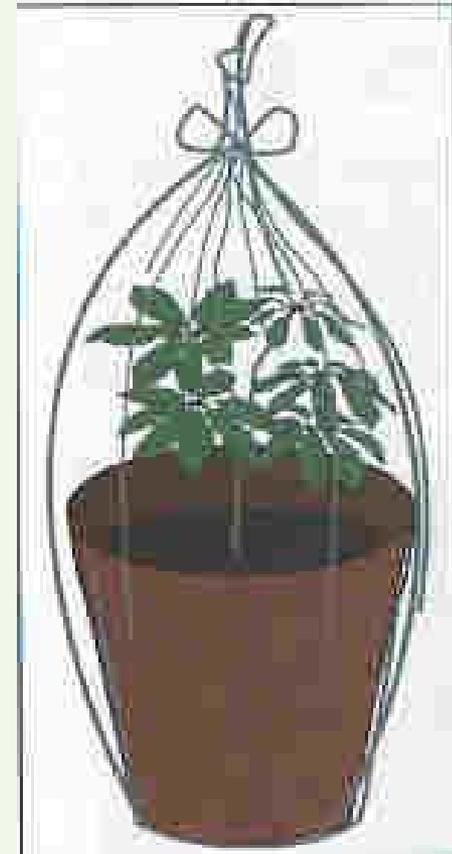


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What Are the Three Types of Stem Cuttings & How Do They Differ?

- Portions of stems that contain terminal or lateral buds are used for ***stem cuttings***
 - There are many types of stems: herbaceous, softwood, semi-hardwood and hardwood

- The end of the stem from the leaf to the next bud (terminal cutting) is placed in the medium
- Stem cuttings may also be made by sectioning the stem (heel cuttings & mallet cuttings) but this may require two to three weeks longer to produce a new plant



Courtesy of Interstate Publishers

Herbaceous Cuttings

- ***Herbaceous cuttings*** are made from plants with stems that do not become woody
 - Many greenhouse plants are propagated by the use of herbaceous cuttings
 - They should be 7 to 10 centimeters long and contain several leaves
 - This type of cutting may be taken at any time of the year
 - These cuttings root easily
 - Examples: geranium, coleus & carnation

Softwood Cuttings

- ***Softwood cuttings*** are taken from the soft, new growth in the spring or early summer
 - These cuttings root easily but require a moist environment
 - The stems are cut and placed in moist media
 - All flower buds and one third of the lower leaves are removed to prevent moisture loss
 - A rooting hormone is applied to the cutting before planting to stimulate root production

Semi-hardwood Cuttings

- ***Semi-hardwood*** cuttings are usually made from woody broadleaf plants in the summer
 - The 7 to 15 centimeter cuttings are taken from the plant after it has finished its rapid summer growth
 - The cuttings are treated with rooting hormone and planted in moist medium
 - Examples: Yew, Juniper, and Holly

Hardwood Cuttings

- ***Hardwood cuttings*** are used to propagate evergreens and deciduous plants with wood stems
 - The cuttings are made during the winter when the plant is in the dormant stage
 - The cuttings are 5 to 15 centimeters in length and are dipped in rooting hormone before planting in moist medium
 - Several months later, in spring, the cuttings develop roots

How Are Roots Used to Propagate Plants?

- Root cuttings are similar to stem cuttings, except that a **root cutting** uses the root or part of the root to propagate a new plant
- This method of propagation is perhaps the least favorite because of the lack of a standardized technique for most plants
- Root cuttings are not as predictable, being more dependent on seasonal influences
 - It is useful for plants that are difficult to propagate

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- Winter and early spring when the parent plant is dormant seems to be the best times to obtain root cuttings
 - Usually the parent plant is lifted from the ground and the roots are cleaned with water
 - Then the new root growth is removed from near the crown of the plant
 - The parent plant can be thrown away or replanted
 - If the parent plant is replanted, the top must be severely pruned to enable the plant to recover

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- Most root cuttings should be 10 cm long
 - They need sufficient food to support itself while it develops stem and leaves
 - Root cuttings are affected by gravity and need to be planted “right side up”
 - Cuttings planted vertically and with the correct end up will have a much higher success rate

What Environmental Factors Affect the Rooting of Cuttings?

- Plants are very individual and each seems to have a preferred method of propagation
- Plants also seem to have a preference for the type of medium, amount of moisture, and temperature for the rooting of their cuttings

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- Most plants do best in a loose, well-drained growing medium
 - The ***growing medium*** will provide the moisture, aeration, nutrients and other conditions favorable for root formation
 - Sterile, disease free rooting medium is essential for success
 - Sand, vermiculite, peat moss, perlite and wood pulp are common examples of materials used alone or in combination in good growing medium

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- Moisture is very important for the growth of the cutting
 - The cuttings cannot absorb water quickly so they must be kept moist
 - However, too much water will cause the cuttings of most plants to rot
 - Misting systems are excellent for providing moisture at frequent intervals to promote root formations

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- Many plants root easily and do not need special treatment
 - However, some plants root better when treated with root-inducing chemicals
 - These powders or liquids contain synthetic root promoting hormones of varying strengths that hasten root initiation as well as increase the number of roots formed
 - Examples: Rootone, Hormodin

Summary

- Why are plants propagated asexually?
- What parts of the plant can be used for this type of propagation?
- How is a leaf cutting used to propagate a plant such as a geranium?
- How is a stem cutting used in propagation? What has to be on the stem?
- How is an herbaceous plant different from a hardwood plant?

Summary Continued

- When is the best time to take a softwood cutting?
- What is the problem with taking a root cutting?
- Describe the characteristics of a good growing medium for cuttings.
- What can be used to enhance the root development on a cutting?