

Plant Propagation Laboratory Introduction and Exercise

Module 3

Propagation of Herbaceous Cuttings

A. Classification of cuttings

Cuttings are classified on the basis of the part of the plant the cutting is taken from and/or the maturity of the plant part.

B. Types of cuttings

1. Herbaceous stem cuttings - prepared from the soft, succulent growth of foliage plants or herbaceous perennial plants.
2. Leaf cuttings - prepared from the leaf blade or leaf blade and petiole.
3. Leaf-bud cuttings - Leaves of species such as the jade plant (*Crassula argentea*), and India rubber plant (*Ficus elastica*) can be rooted but no new shoots will ever develop unless an axillary bud is included as found in a leaf-bud cutting. A leaf-bud cutting consists of a leaf blade and petiole, and a short section of the stem with the attached axillary bud. This method allows you to take many cuttings from a limited supply of cutting material. Many herbaceous and a number of woody species will root well and produce excellent plants from leaf-bud cuttings.
4. Root Cuttings - Propagation by root cuttings is fairly simple and a wide range of species can be propagated by this method. Major factors to be considered include the proper time of the year to take the cuttings and maintenance of correct polarity.

The best time to take root cuttings of woody and herbaceous species is late winter or early spring when the roots are well supplied with stored food and before active (new) growth has begun. When making root cuttings, a slanted cut should be made at the distal end to aid in identification.

C. Polarity of cuttings

The polarity of cuttings refers to the inherent quality or condition of a cutting that exhibits different properties in opposite parts, i.e., stem cuttings form shoots at the distal end (nearest the shoot tip), and roots form at the proximal end (nearest the crown), which is the junction of roots and shoots. Changing the position of the cutting with respect to gravity does not alter this tendency. The strength at which plant parts exhibit polarity differs; stems are very polar, roots are somewhat polar, and leaves are not polar. The following table indicates the effects of polarity on root and shoot formation on stem and root cuttings.

Polarity of Stem Cuttings		Polarity of Root Cuttings	
<i>Proximal end</i>	<i>Distal end</i>	<i>Proximal end</i>	<i>Distal end</i>
Root formation	Shoot formation	Shoot formation	Root formation

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Propagation of herbaceous perennials from stem cuttings, leaf-bud cuttings, and root cuttings

This laboratory will introduce you to propagating herbaceous perennials from stem cuttings, leaf-bud cuttings, and root cuttings. For most species, half of the material will be treated with Hormodin #1 rooting powder and the other half will not. Label your treated and nontreated cuttings and keep records of their comparative rooting development. Generally, most of these herbaceous materials do not benefit from auxin treatment, although some may. However, when such herbaceous cuttings are treated with root-promoting compounds they root more uniformly and develop a larger root system. Following preparation and treatment of the cuttings, place them in your assigned rooting area. The data sheet for the herbaceous cutting experiment will be turned in at the end of the semester along with your summary of the results.

1. Herbaceous stem cuttings

Following demonstration by your lab instructor, take stem cuttings (depending on the quantity of material available) from the plant material provided. Treat half the cuttings with Hormodin #1 and do not treat the remaining half. The cuttings should be inserted into the rooting substrate using the procedure described above.

2. Leaf Cuttings

Detach one or several leaves with a sharp blade. The techniques vary from species. A few examples follow:

a. African Violet (*Sandpaulina* spp.)

Detach some leaves with the petiole and some without the petiole. Treat half with Hormodin #1. Place the petiole in the substrate for those with the petiole attached and place the base of the leaf in the substrate for those without the petiole. Be sure to place a portion of the midvein in the rooting substrate.

b. Kalanchoe (*Kalanchoe* spp.)

Detach leaves with petioles and place flat on the rooting substrate making sure that the leaf margins are in contact with the rooting substrate. Curved leaves may have to be weighed down with substrate.

c. Snake Plant (*Sansevieria trifasciata* 'Laurentii Compacta') or (*Sansevieria trifasciata* 'Hahnii')

Cut a 2 to 3" leaf section across the leaf. It is advisable to make an additional slanted cut to identify the base of each cutting. Treat half the cutting with Hormodin #1, insert all cuttings into the rooting substrate.

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d. Rex Begonia (*Begonia rex-cultorum*)

Detach a mature leaf. Remove the petiole. Cut the large veins on the underside of the leaf. Place the leaf flat on the rooting substrate with the upper surface up. Weight down leaf as needed.

3. Leaf-bud cuttings

Make 2 to 4 leaf-bud cuttings from the plant material provided. This cutting should have the axillary bud attached to the petiole. Treat half of the cuttings with auxin.

4. Root Cuttings

Prepare some root cuttings of the plant material provided. Remember to maintain correct polarity when inserting these cuttings into the rooting substrate. A common plant used for this demonstration is *Stokesia*.

Evaluate your cuttings after several weeks to determine rooting percentages, etc. This lab exercise should provide an opportunity for you to see the various ways these plants develop new growing points from these various types of cuttings.