

Propagation by Cuttings

Definition

A cutting is a section of plant such as a modified stem, leaf, or root used for vegetative propagation that forms either adventitious shoots, adventitious roots (stem and single node cuttings), or both (root and leaf cuttings).

Types

There are four general types of cuttings: stem cuttings, leaf cuttings, root cuttings, and single node cuttings.

- Stem cuttings: segments of shoots containing lateral and/or terminal buds
 - Hardwood stem cuttings are obtained from mature and dormant stems of both deciduous and evergreen species.
 - Semi-hardwood stem cuttings are obtained from new growth in the current growing season after it has begun to harden off.
 - Softwood stem cuttings are obtained from soft and succulent shoots emerging early in a new growing season.
- Leaf cuttings are obtained from leaf blades or leaf blades with the petiole still attached.
- Root cuttings are obtained from sections of roots.
- Single node cuttings are obtained from a section of a shoot with a leaf blade, petiole, and a piece of the stem with the attached axillary bud.

Collection and Storage

- Stem cuttings should be taken from ontogenetically young sections of the parent plant.
- Hardwood stem cuttings are usually taken in late autumn and winter months when the tree/shrub is dormant
 - store in a cool, moist environment until they can be planted in a moisture-retentive media such as vermiculite with high humidity
- Semi-hardwood stem cuttings are taken early on a cool day in the mid to late summer months to prevent dehydration.
 - store in a dark, moist room until planting in a moisture-retentive media with high humidity levels.
- Softwood stem cuttings are taken early on a cool day in late spring or early summer
 - stored in a high humidity environment until planting in a moisture-retentive media.
 - These cuttings require more care to prevent them from drying out than the semi-hardwood and hardwood cuttings.
- Leaf cuttings, root cuttings, and single node cuttings are taken from healthy sections of the parent plant, placed in soil media such as perlite, vermiculite/pumice, or compost soon afterwards, and kept in high humidity
High humidity should be maintained by misting the cuttings or by keeping the cuttings in a colorless plastic bag.

References

- Hartmann & Kester's Plant Propagation: Principles and Practices (8th Edition)
- Plant Propagation: Concepts and Laboratory Exercises by Beyl and Trigiano
- Making More Plants: The Science, Art and Joy of Propagation by Ken Druse

- “Plant Propagation by Stem Cuttings: Instructions for the Home Gardener” from NC State University
- “How to Take Cuttings - 4 Minute Guide to Clones and Cloning” on YouTube
- “Plant Propagation by Leaf, Cane, and Root Cuttings: Instructions for the Home Gardener” from NC State University
- “How To Take Leaf Lamina Cuttings - Horticultural Tips - Nottingham Trent University” on Youtube
- The American Society for Horticultural Science at www.ashs.org
- The International Plant Propagator’s Society at www.ipps.org

Activity

This activity will focus on propagation by hardwood stem cuttings, which will be provided. Cut the stems into 6 in. – 7 in. pieces, keeping buds intact. Cut the proximal, or bottom part of the stem at a 45°. This increases surface area for rooting hormones and soil contact. Insert the stems 2 in. – 3 in. deep in the potting media.



Figure 1. Stem cuttings after placement in potting media on February 17th, 2017.

Check the stems every two to three days and water when the potting media looks dry. Stems should root within three to four weeks. If buds break earlier than three weeks after planting the cutting, place a plastic bag over top of the pot to increase humidity and reduce water loss. Roots need to form before buds break so they can provide the shoots with water and nutrients.



Figure 2. Stem cuttings after approximately four weeks on april 12th, 2017.

Additionally, we will be doing softwood stem cuttings and leaf cuttings. The softwood cuttings are done in the same way as the hardwood except they must always be kept moist and placed in a plastic bag after watering. Leaf cutting propagation will be done using a whole leaf with the petiole still attached. The edges will be trimmed to reduce leaf area and limit water loss, then the leaf will be planted in water retentive media and placed in a plastic bag.



Figure 3: Whole begonia leaf with petiole buried

Tips

Stem cuttings can be placed horizontally on moist sand and stored in a cool environment for two to three weeks. The cuttings will undergo a process called etiolation which results in elongated shoot and root formation. The new shoots and roots will be a yellow color. Etiolation increases the chance of successful rooting in stem cutting propagation.

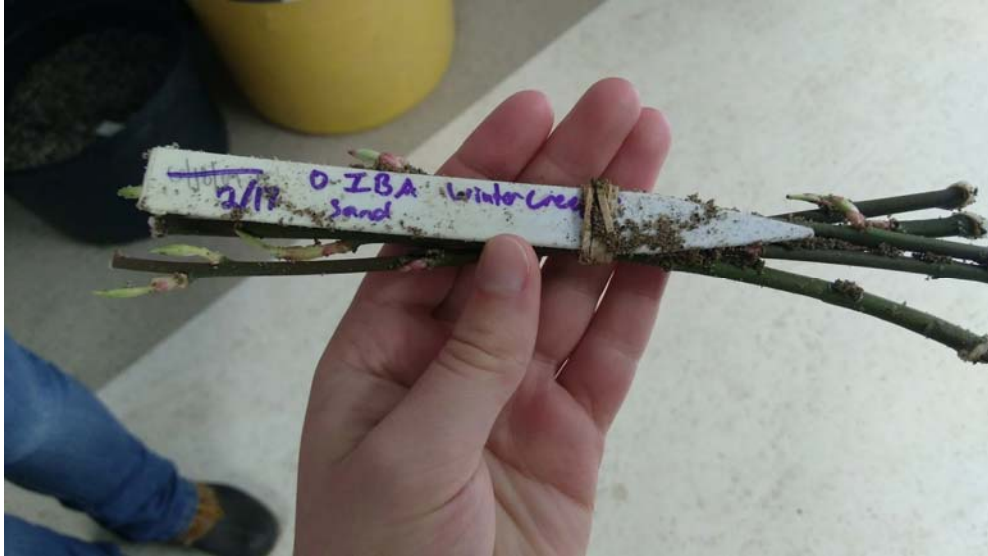


Figure 4: Stem cutting with etiolated shoots and lots of callus tissue at the cut after removal from sand

An inexpensive propagation chamber can be made from a Styrofoam box. Moist sphagnum moss can be placed in the Styrofoam box. Cuttings can be inserted into the media and sand can be used for support. The Styrofoam box and cuttings can then be placed in a plastic bag to maintain a high humidity environment.