SOUTH CAROLINA FAMILY AND COMMUNITY LEADERS
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Leader Training Guide

How to Propagate Plants

Objectives:
After completing this lesson, students will be able to determine how to properly take a cutting and successfully root a new plant.

Lesson Overview/Introduction:
Students will learn how to take cuttings, as well as the proper care in handling them. This includes soil rooting containers and medium, stem preparation, humidity level, checking for roots and repotting and overwintering care.

Lesson:
Rooting plants from cuttings is an easy and economical way to produce exact copies of the parent plant. Many woody plants are normally propagated by stem cuttings. The first step in this process is to make sure there are no copyright, patent or trademark restrictions on the parent plant before taking cuttings. By law, plants with these restrictions cannot be propagated without permission.

Taking Stem Cuttings:
Each cutting should be at least 4 to 5 inches long, and from semi-hardwood stems. After the new growth is complete in the spring, the leaves will be fully matured, and the stem will not snap when easily bent. For most woody plants, the ideal time to take cuttings would be from mid-July through September. Cuttings should always be taken in the early morning from healthy, disease-free and pest free plants. The parent shrubs should not be under drought stress, so be sure they are well-watered two days prior to taking the cuttings. Each cutting should be taken from the ends of branches.

Care of Cuttings:
Cuttings can be placed in plastic food storage bags, and the bags labeled with the cultivar name and date. Put the bags immediately into a cooler of ice or in a refrigerator to prevent drying of the cuttings. Cuttings may be held as long as one to two days in the refrigerator, but do not add water to the bags as this may promote rot.

Soil Rooting Containers and Medium:
Different types of containers may be used, but be sure there are drain holes in the container. Plastic gallon nursery pots, 5-inch pots, cell packs or even the bottom portion of a plastic milk carton may be used. If using milk cartons, be sure to cut several drainage holes in the bottom. It's extremely important that the containers be sterile and free of disease and insects. If the containers are used, scrub them with soap and water to remove any old soil, then submerse them briefly in a 1:10 solution of household bleach and water. This will kill any pathogens that may be on the containers.

The rooting medium must be well drained. An excellent combination is a 1:1 mix of peat moss and perlite. Before filling the containers, wet the soil mix in a clean tub or bucket, letting it absorb water. Fill the containers, allowing the excess moisture to drain out of the holes.

Stem Preparation:
The cut end of each cutting should be trimmed making a fresh cut just below a node. The nodes are the where the leaves attach to the stem. Carefully remove all leaves from the bottom one third of the cutting. Typically three to five leaves will be left on the cutting. To encourage more branching, the top or terminal bud may also be removed. Remove any flower buds, so the cutting will not expend stored energy in trying to flower.

It may encourage faster rooting if the lower one half to one inch of stem is wounded on one side by scraping the bark off with a sharp knife. Wet the stem end of each cutting. Place a small amount of talc based rooting hormone in a separate small dish, and then roll the bottom one inch of the stem. Do not dip the cutting into the original hormone container, as this might contaminate the hormone powder. Examples of rooting hormones are Green Light Rooting Hormone, Scott/ Miracle-Gro® Fast Root® Rooting Hormone and Gardentech Rootone®. Tap off any excess.

In larger containers the cuttings should be spaced two or three inches apart. Use a dibble (or a thick marker or pen) to make individual holes in the rooting soil mix, and then insert the cuttings to a depth of about one third their lengths. At least one node must be beneath the soil. Firm the soil against each cutting and gently water to settle the soil. Fertilizers should not be added initially, but can be applied after rooting of the cuttings has occurred.

Keep the Relative Humidity High:
Initially the cuttings have no roots. To prevent the cuttings from drying out, the relative humidity must be kept close to 100%. This can be accomplished by placing a wire frame into and above the pot, and then enclosing the pot and frame in a white or transparent plastic bag. The wire frame may be made from straightened coat hangers. The wire frame prevents the plastic bag from touching the foliage of the cuttings.

Another way is to cut the upper portion of a clear and colorless, 2-liter soft drink bottle with the cap on and place it over the cuttings in the pot. If cell-packs are used to hold the rooting medium for smaller cuttings, the cell-packs can be placed into a standard greenhouse flat, and the top of the flat covered with a clear plastic propagation dome.

Place all containers outside in bright indirect light. Do not allow direct sunlight to contact these miniature greenhouses as the cuttings may dry or get too hot. Inspect the medium every week to determine if additional water is necessary. With adequate soil moisture, there will be condensation on the plastic covering. Keep the medium moist, but not wet. Cutting death is most commonly caused by uneven moisture.

Checking for Roots:
Within five to eight weeks the cuttings will begin to form roots. Check for rooting by gently tugging on the cuttings. If resistance is felt, the cuttings are becoming successfully rooted. Now that roots are present, the relative humidity can be lowered. Depending on which method was used, remove the caps from the 2-liter bottles, make slits in the plastic bag covers, or slightly prop up one end of the plastic propagation domes. This will help acclimate the young plants to the surrounding conditions. At this point, also increase the light level slightly by allowing the cuttings to be exposed to a couple of hours of morning sun. The young plants with roots can now be lightly fertilized. Use a dilute, ¼-strength liquid fertilizer on a weekly basis.

After another month, the cuttings can be completely uncovered and exposed to more morning sun. Check the medium often to be sure the young plants do not dry out. Larger containers will need additional water less often than will smaller containers or cell packs.

Up-Potting and Over Wintering:
After the root systems of cuttings are one to three inches long, the plants can gently be separated and potted up individually. Overwinter the plants outside in a cold frame or protected area. Roots will continue to grow in the fall and the following spring. These plants can replanted into the landscape in the early spring, or held for additional growth in containers.

Lesson Summary:
Propagating plants by semi-hardwood cuttings is an easy and inexpensive way to produce exact copies of the parent plants. The student must make sure there are no registered, trade-marked or patented restrictions on the desired plant variety. By following the criteria discussed, the student should have success in propagating a new plant from a cutting.

Suggested Activities:

-Determine what plants could be successfully propagated.

-Do research to make sure the parent plants do not have registered, trade-marked or patented restrictions.

-Choose the desired containers and the method used to control the humidity level.

-Choose the desired rooting hormone.

-Have a plant sale with the finished product that would benefit student horticulture programs.

Suggested Materials:

HGIC Hot Topics June 2008 Propagating Evergreen Azaleas by Cuttings

http://www.clemson.edu/extension/hgic/hot_topics/2008/06propagation.html

Bulletin 641 Propagating Shrubs from Cuttings

www.caes.uga.edu/.../Propagation_Schedule_for_Woody_Ornamentals.doc

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Sources/References:

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