# Propagating Native Hawaiian Plants with Vegetative Cuttings: You Wiliwili Can Do It!

# In Class Activity

GOAL: To have students become familiar with native Hawaiian plants, their potential uses and methods of vegetative propagation

### OBJECTIVES

- Students investigate native plant of interest using web-sites
- Students illustrate and discuss their plant of interest in class

### USEFUL DEFINITIONS

<u>Propagation</u> - the act of re-producing plants. Propagation can be either sexually (seeds) or asexually (vegetative) re-produced.

<u>Sexual (Seed) Propagation</u> - germinating seeds to re-produce plants. Plants propagated with seed will be *genetically different* than parent plant.

<u>Asexual (Vegetative) Propagation</u> - using plant parts other than seeds to reproduce plants. This may include pieces vegetation such as: stems, roots and leaves. Plants re-produced from vegetative pieces will be *genetically identical* to the parent plant.

Parent or Stock Plant - Plant(s) from which cuttings are taken.

<u>Cutting</u> – a portion of stem, root or leaf that is cut from the parent or stock plant and induced to form roots and shoots by chemical, mechanical and/or environmental manipulation.

<u>Shoot</u> - The portion of a plant that contains stems, leaves and nodes.

<u>Bud</u> - A much reduced, developing shoot, usually found in a node.

Node - A portion on stem directly above where a leaf attaches.

Internode - The portion of stem between a node and the next leaf.

Rooting hormone - plant chemicals used to help cuttings develop roots

<u>Rooting Media</u> - materials such as: sand, volcanic cinder, volcanic sponge rock (Perlite), expanded mica (Vermiculite), and peat (decomposed bog vegetation) used as substrate for rooting of cuttings.

## Activity 1

1) Visit the Hawaiian Native Plant Propagation website at: <a href="http://pdcs.ctahr.hawaii.edu:591/hawnprop/default.htm">http://pdcs.ctahr.hawaii.edu:591/hawnprop/default.htm</a>.

2) Browse the database using Hawaiian Names

3) Select one plant that interests you

4) Illustrate your plant of interest and the environment in which it grows. You may also visit: <u>http://www.botany.hawaii.edu/faculty/carr/natives.htm</u> for more pictures. Clicking on pictures in this website will enlarge them. Be prepared to share your illustration with other class members.

5) Discuss the Hawaiian name of your plant and its meaning, potential uses of the plant; anything interesting about its description and geographic range and methods of vegetative propagation (*Some plants in the database do not have information concerning vegetative propagation. Try to select one that does have information on vegetative propagation.*)

6) Create a list of questions you have concerning vegetative propagation and bring to Waipa.



### Propagating Native Hawaiian Plants: Yes, You Wiliwili Can Do It! Waipa Activities March 7, 2003

Morning Activities (3 rotating groups)

- 1) Students collect data from seed experiments and create graphs for discussion in the afternoon.
- 2) Discussion on vegetative propagation with examples and practice on how to take cuttings, dip in rooting hormone and stick in tray. We will also discuss experimental design and replication
- 3) Students prepare and label trays for use in the afternoon.

Lunch

Afternoon Activities

- 1) Science Conference all groups assemble to discuss and compare results of seed experiments
- 2) All groups go out to take, prepare and stick cuttings
- Critical thinking exercise (can be completed in class if we run out of time)

Materials Needed

Graph paper Rulers Pens, pencils, markers, clipboards Pot labels (I have these) 9 Plastic pot trays with drainage holes/slots 3 different types of planting media (e.g. Perlite, vermicultie, sunshine mix) Liquid rooting hormone of 3 concentrations (I have this) Dibble stick (e.g. pencil or bamboo stake) Plant to take multiple cuttings from (135 cutting needed) Pruning shears to take cuttings Bench space for trays Mist irrigation or propagation chamber Flip chart

#### Seed Data Collection

Students count number of emerged seedlings in each treatment and compile graphs

Graphs should have number of germinated seed on the y-axis and treatment on x-axis (see below)



Treatment



#### Preparation and Labeling of Trays

There will be 3 groups of students for this project. Group 1 will investigate the effects of different hormone concentration on rooting. Group 2 will investigate the effects of different media on rooting. Group 3 will investigate combined effects of media and hormone concentration. All hormone concentrations will be distributed in the afternoon.

<u>Group 1</u> (Same media, different hormone concentration)

- This group needs 3 trays and 1 type of media
- Students fill each tray with the same media
- Each tray is to be divided into three equal parts using pot label (see below)



- In each tray, each section will be labeled with one pot label in order to identify the treatment.
- Tray 1 should have labels with the date, media used and 1<sup>st</sup> hormone concentration. Note that in trays 2 and 3 the only information to change on the labels will be the hormone concentration.

<u>Group 2</u> (Same hormone, different media)

- This group needs 3 trays and 3 types of media
- Students fill each tray with one of the different media types
- Each tray is divided as above
- Trays will be labeled as above
- Tray 1 should have labels with the date, media used and hormone concentration. Note that in trays 2 and 3 the only information to change on the labels will be the media type

<u>Group 3</u> (Different hormone, different media)

- This group needs 3 trays and 3 types of media
- Students fill each tray with one of the different media types
- Each tray is divided as above
- Trays will be labeled as above
- Labels should have the date, media used and hormone concentration.
  Labels should look like this:





## Critical Thinking Exercise

Define vegetative propagation - "Vegetative propagation is ...

Use your own words to describe vegetative propagation - "In other words vegetative propagations means ...

Give an analogy for vegetative propagation - Vegetative propagation is like ...

Create an illustration for vegetative propagation