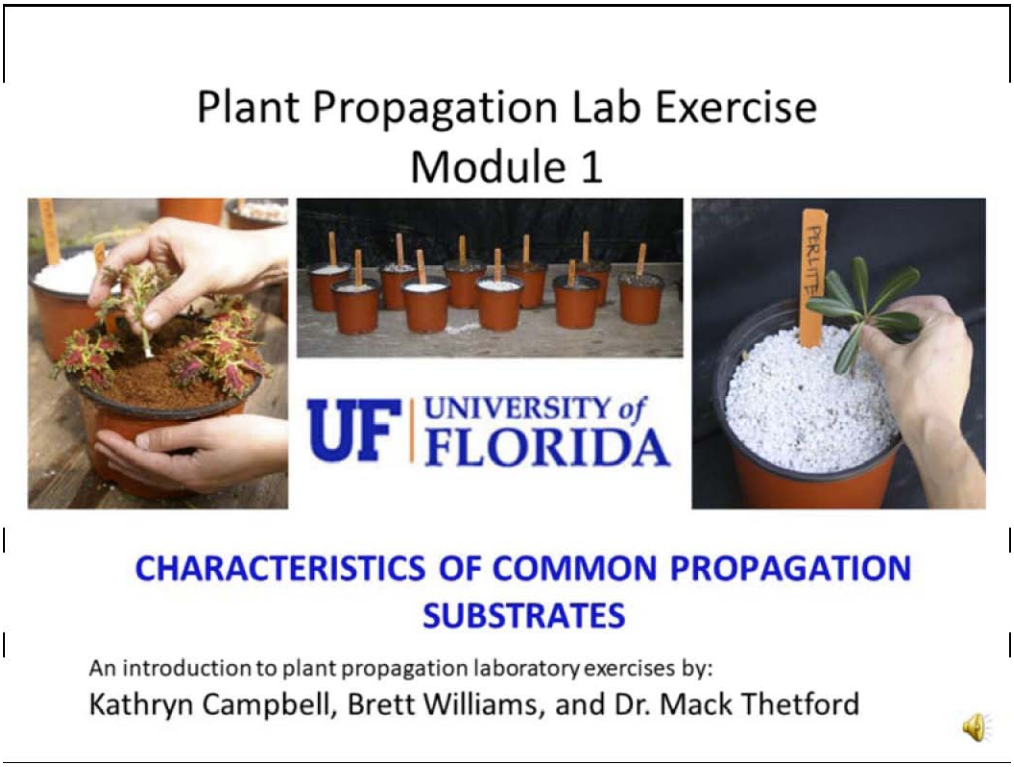

In this lab, you will be introduced to a number of common propagation substrates that we will be using throughout the plant propagation lab. The characteristics of an ideal substrate will be discussed as well as attributes of individual substrates with which you will need to be familiar. It is important to remember that no one substrate is ideal for rooting a given species or cutting type. Attention must be given to the specific needs and preferences of a given species and/or cutting. Selecting the appropriate substrate for a given cutting is vital to ensure the rooting success of that cutting. It requires a knowledge of the ideal rooting conditions for both the species and type of cutting as well as an understanding of the nature of the various substrates. In this lab exercise, we will compare cuttings rooted in a number of common substrates.

The objectives of this lab are to first, introduce students to various substrates and substrate mixes; second, demonstrate differences in water-holding capacity, porosity, and weight among common substrates; third, demonstrate proper technique for selecting, preparing, and sticking stem cuttings; and finally, to compare the effects of propagation substrates on rooting of cuttings.

The composition of propagation media has a dramatic effect on water and oxygen availability. Optimum rooting response of various plant species may require media of differing water holding capacity and/or oxygen availability. Mixing substrates with different physical and chemical properties is often recommended to provide optimal rooting conditions.

The materials for this lab include: an assortment of propagation substrates, at least 10 pots or flats, 10 plastic tags, a wax pencil for marking the tags, pruners, a common rooting hormone such as Hormodin #1, plant material for cuttings, and a bucket, plastic bag, or cooler to store cuttings and prevent desiccation Substrate should be prepared for cuttings by sterilizing containers using steam pasteurization or a 2% bleach solution, lining containers with paper towels if they are porous enough for substrate to leak out, mixing substrates at a 50:50 ratio unless otherwise directed by your instructor, filling the containers with substrate, and then watering substrate

thoroughly. Watering the substrate will improve the firmness of the substrate to hold cuttings and ensure proper moisture during propagation.

To prepare a cutting count back 3 to 4 nodes from the stem tip and cut just above the node. If the internodes are short you may need to remove a few leaves from the base of the cutting.

The following substrates are common in propagation. Obtain these, or other provided substrates, for comparison in this lab and prepare as instructed previously.

Organic components

Peat, sphagnum moss, or softwood and hardwood barks.

Course mineral components

Perlite, vermiculite, expanded shale, coarse sand or grit, pumice, and rockwool.

Polystyrene – may have restricted use when you consider the fate of Styrofoam in the environment. Particularly in production of plants for restoration of natural areas.

Course mineral components are used to increase the proportion of large, air-filled pores and drainage.

Most propagators use a combination of organic and mineral components and sometimes the mineral component is used alone or in combination.

A trend in the US is to replace the peat component with fine ground bark, coconut hulls(Coir), or whole pine tree substrates.

Coconut coir (mixed with perlite) and whole pine tree substrates are also being utilized as a peat substitute in propagation.

Rockwool cubes or sheets can be handled efficiently and there is minimal disturbance of roots.

Paper sleeves are the most recent addition to propagation substrates and can be manufactured on-site at various lengths with locally mixed substrates for larger operations.

Self contained propagation substrates such as oasis, stabilized peat and paper sleeves allows for minimal root disturbance and helps to avoid transplant shock as cuttings are shifted to liner production.

6 cuttings should be prepared and stuck for each substrate.

Uniformity of cutting length may be obtained by aligning the tips and cutting at the base to a uniform length.

Cuttings should not be dipped in the stock container of a rooting compound – place a small amount in a separate container.

Cuttings should be stripped of their lowest leaves, cut to equal stem lengths, and dipped in rooting hormone prior to sticking Cuttings should be inserted just deep enough so that they can stand. Space the cuttings ½ to 2 inches apart so that leaves are barely touching. Firm cuttings into the substrate, water gently, and place on a mist bench.