

Plant Propagation Lab Exercise

Module 1



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CHARACTERISTICS OF COMMON PROPAGATION SUBSTRATES

An introduction to plant propagation laboratory exercises by:
Kathryn Campbell, Brett Williams, and Dr. Mack Thetford



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Determining the effects of propagation substrates on rooting of herbaceous and woody cuttings

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LAB OBJECTIVES

- **Introduce students to a variety of propagation substrates.**
- **Demonstrate differences in water-holding capacity, porosity, and weight among common propagation substrates.**
- **Demonstrate proper technique for selection, preparation and sticking of stem cuttings.**
- **Compare effects of propagation substrates on rooting of herbaceous and woody cuttings.**



BACKGROUND

- **Composition of propagation media influences availability of oxygen and H₂O to plant roots**
- **Ideal medium = proper balance of air and H₂O for specific plant species**
- **Mixing of substrates is recommended to promote optimum rooting response**



MATERIALS

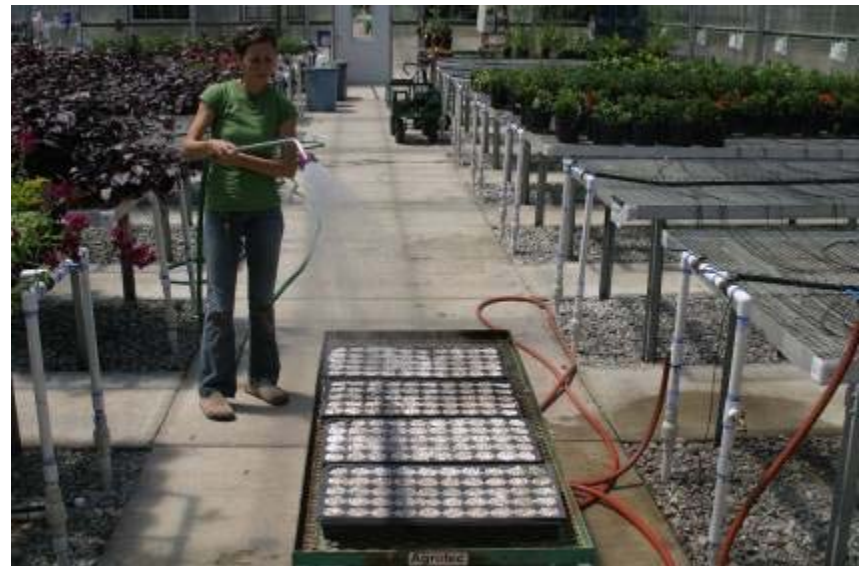


- Assorted propagation substrates
- Pots or flats
- Tags
- Wax Pencil
- Pruners
- Rooting hormone
- Stock Plants
- Bucket, plastic bag or cooler



SUBSTRATE PREPARATION

1. Sterilize containers
2. Mix equal proportions of given substrates (50:50) or as directed by lab instructor
3. Fill containers with substrate
4. Water substrate in thoroughly and evenly!



PREPARING A CUTTING



A video demonstration of cutting preparation is also available



COMMON SUBSTRATES



1. Sand
2. Vermiculite
3. Perlite
4. Perlite/Vermiculite (50:50)
5. Coir
6. Coir/Perlite (50:50)
7. Peat
8. Peat/Perlite (50:50)
9. Garden Soil
10. Commercial Mix



Various rooting media used by propagators

- (a) Sand
- (b) Bark
- (c) Peat-perlite mix
- (d) Perlite
- (e) Coconut coir
- (f) Pumice
- (g) Oasis foam block
- (h) Stabilized peat
- (i) Stabilized peat
- (j) Peat-perlite in a paper sleeve.



*** 6 CUTTINGS PER 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 inserted just deep enough so that they can stand.



Lab Activities and Observations

- Consult your local lab instructor regarding your local substrate experiments and additional lab activities.
- Some observations to consider which may assist you in your discussion of future experiment data:
 - First
 - Take a small volume of each substrate and apply the same quantity of water to each.
 - Make observations on the ease of wetting each substrate and determine if the volume of water applied to each had the same impact on wetting the substrate.
 - Next
 - Saturate each of the substrates and allow the excess water to drain for about 20 minutes before lifting (or weighing) each container to compare the relative weight of each substrate. Rank the substrates based on weight and relate this to water holding capacity and drainage.
 - Use a pencil or a cutting and insert it into each of the saturated substrates and observe the ease or difficulty of penetrating the substrate.