CONTAINERS AND MEDIA

I. CONTAINERS

There are many different types of containers in which houseplants can be grown, with a range of sizes, shapes, and designs. Unlike the natural conditions of plants growing in the ground, containers impose some limitations on plant growth. One way of categorizing or grouping the many different types of containers is by their function:

1. **Containers for seedling growth** - generating houseplants from seeds is very common in the horticultural industry . A **"seedling"** is nothing other than a plant that develops or germinates from a seed, and seed germination and seedling growth typically occurs in confined and temporary quarters. The containers in which they are germinated are not intended to be permanent.

a. Cell packs - these are preformed plastic sheets with "cells" of a uniform size. Each each cell, regardless of size, has drainage holes, which is critical in virtually all plant containers. Seeds can be sown directly into each cell or they can receive seedlings from larger germination trays.

b. Peat pots - these are cleverly manufactured pots made of compressed, formed peat moss. These are handy because they can be planted directly into permanent containers when the plants mature. The peat degrades slowly and allows the roots to penetrate through. One important practice in transplanting the peat pot to a permanent container: always plant the rim of the peat pot beneath the level of the medium to prevent moisture from being "wicked away". If that occurs, the delicate root system of the seedling can be damaged due to excessive loss of water. Peat pots may be used for direct germination or temporary transplanting.

c. Expanding Pellets - this is also a compressed peat product where the peatmoss has been pressed within a degradable netting. These pellets are primarily used for seed germination: the pellet is placed in a tray of water long enough for expansion, after which a seed is placed on top (or covered). The entire unit is transplanted into a larger container when the plant is large enough.

2. Containers for continued growth - Since most houseplants have the theoretical potential to grow indefinitely (indeterminate growth), this category of containers is by far the largest. They vary in size, shape, color, material and aesthetic value to accommodate the needs of an ever-enlarging plant and the interior design needs of the environment. Some of the more common and important types are:

a. Plastic pots with drainage - Since plastic has become such a cheap material, this category is clearly the most prevalent, inexpensive and versatile in terms of design. These plastic pots are non-permeable and only permit the loss of excess water either through the drainage holes in the bottom or by way of evaporation from the exposed surface of the medium. For people who tend to overwater, plastic pots may NOT be the best material because they are not porous. Square and round pots are available, but round pots tend to be the most common choice.

Plastic pots are easily re-used if cleaned properly.

b. Unglazed clay with drainage - "Porosity" is the major difference between plastic and unglazed clay. This earthen material "breathes" and readily exchanges air and water with the atmosphere, in addition to the benefits of drainage holes and surface evaporation. This is the best choice for the "heavy waterer", but is generally more expensive than plastic and more fragile. The terra cotta color is making a popular comeback and causing a rise in demand.

Both plastic and unglazed clay pots with drainage holes are the most popular containers and come in 3 basic designs:

1. Standard - these pots are about as deep as wide and allow for good vertical root penetration. They are the best choice for most houseplants.

2. Azalea - these pots are wider than deep and are less inclined to tip over with a heavy foliage plant, such as an Azalea (for which they are named). These are almost as versatile as standard pots, but particularly well-suited for plants with more shallow root systems.

3. Pan - these pots are approximately twice as wide as deep and designed for planting bulbs that are planted shallow to force flowering. They can

also be used for shallow rooted plants such as cacti and succulents.

c. Glazed clay with drainage - Glazed pots essentially have their porosity eliminated by sealing up. This process enhances the "aesthetics" of the container by providing a wide range of color choices besides the basic terra cotta. Their water loss capabilities are similar to plastic, but like the unglazed pots, they remain more fragile and more expensive than plastic. Like plastic, all clay pots can be re-used after cleaning.

d. Any material without drainage - Most plants will die if allowed to remain in soggy medium after watering; that is why drainage holes are so important in containers. However, containers without drainage holes can be modified to reduce the amount of excess water the roots are exposed to. Still, one has to be careful. If you do have a pot without drainage holes, it would be best if it were unglazed clay because of its porosity. What you do is place a layer of coarse gravel or broken clay shards on the bottom of the container before putting in the medium. Then you will at least have an area where excessive water can collect. However, a better option when confronted with a pot without drainage holes is to Double Pot:

1. Purchase or pot up a plant in a plain container with drainage holes.

2. Place a layer of gravel on the bottom of the decorative pot without drainage holes.

3. Place the smaller pot into the larger one, and water as needed; you'll get both drainage and a decorative container.

e. Self-watering pots - These pots are constructed to hold a reservoir of water and have become more and more common in retail stores and garden shops in both small and larger sizes. Water is released or taken up in the medium by the process of "capillarity". Caution: It might be best to experiment with these containers before you abandon the more traditional types.

Finally under the subject of containers: cleaning containers for re-use. Both plastic and clay can be safely re-used if one deals with the 2 major prior "inhabitants" in the

containers: *fertilizer residues and possible *plant disease pests (bacteria, fungi and viruses). To deal with these problems, you can:

1. Soak the pots in hot tap water with common dish detergent, scrub with a stiff brush and rinse in clear water. This technique is safe and effective in removing residues, but it may not kill all the dangerous disease-causing pests left behind.

2. Another choice is to soak the pots in a 10% household bleach solution (1 part bleach and 9 parts water) for several hours. Then scrub with a stiff brush and rinse thoroughly with clean water. This method will not only get rid of residues but will also kill most serious pests.

II. MEDIA

The term **"soil"** has not been used thus far to describe the substrate in which our houseplants are grown. This is because when soil is used to grow houseplants in, it's usually just one of several components of the growing medium. Under no circumstances should the term "dirt" be used to describe the medium in which our plants are growing. The functions of media are:

a. to provide mechanical support (anchorage) for plants
b. to hold water
c. to retain nutrients over a prolonged period
d. to provide oxygen to plant roots (aeration)
e. to support growth of favorable microorganisms

By growing our plants indoors as opposed to outside, we can completely control the type of media used and influence to a large degree how well water and some nutrients are retained or lost. Two things to remember as far as water retention (water-holding capacity), water loss and nutrient retention of a medium:

1. The addition of coarse textured materials (e.g. sand or gravel) increases the drainage capacity of a medium.

2. The addition of organic matter (e.g. peat moss) increases both water and nutrient/fertilizer retention in a medium.

Selected Components of Media:

a. Garden loam - a natural mix of sand, silt and /or clay; must be pasteurized (baked at 200F for 30 minutes) prior to using; poor choice as a component.

b. Bagged potting soil - highly unpredictable due to the heterogeneous nature of soil; some sources hold too much water or have poor drainage properties or high soluble salts (will discuss later) and must be amended with other components; most brands come sterile and ready to use.

c. Perlite - heat-treated (2000F) and crushed volcanic rock; sterile; one of the best components to increase the drainage of a mix; comes in different sizes (grades) and is an excellent substitute for sand, although more expensive.

d. Vermiculite - heat-treated (over 1000F) mica; sterile; expands when in contact with water and has excellent water-holding-capacity, although it has tendency to become compacted over time; comes in various grades but AVOID INSULATION GRADE VERMICULITE - it contains harmful impurities.

e. Sand - avoid ocean sand due to high salt content or coarse builder's sand that is not pasteurized; use horticultural or washed sand; bagged play sand is also clean; improves drainage of any mix.

f. Peat Moss - dug from deposits in Canada, Europe and northern states (Mich) and made up of partially decomposed marsh mosses; is lightweight, increases aeration and has high moisture and nutrient holding capacity; releases small amount of nutrients (eg. nitrogen) on decomposition; clean.

g. Sphagnum Peat Moss - dug from deposits containing dried bog plants from genus Sphagnum and has greater water-holding-capacity than regular peat moss; has some anti-fungal properties making it desirable as component in medium for seed germination; comes in chunky fragments useful for pole supports (unmilled) or finer grade for incorporation into mixes (milled), clean.

h. Composted Pine Bark - organic matter that comes in variable chunk size which increases drainage and holds water simultaneously; holds nutrients and is

clean.

Basic Houseplant Mixes:

1. Soil based:
   1 part bagged potting soil
   1 part peat moss or sphagnum peat moss
   1 part sand or perlite

2. Soilless (by volume)
   3 parts peat moss or sphagnum peat moss
   1 part vermiculite
   1 part perlite

3. Commercial mixes (Soilless)
   a. Sunshine mix (brand name) - will use to pot up plants during semester
   b. Metromix (brand name)
   c. Pro-mix (brand name)