

Indoor Plant Culture

➤ Purchasing an Interior Plant

- Select only those plants that appear to be free of pests
 - Check the undersides of the foliage and the junction of leaf and stem for signs of insects or disease. Select plants that look sturdy, clean, and well-potted.
 - Choose plants with healthy foliage.
- Avoid plants with yellow or chlorotic leaves, brown leaf margins, wilted foliage, spots or blotches, or spindly growth
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- Plants that have new flower and leaf buds along with young growth are usually of superior quality.

Transporting House Plants

- The two seasons of the year that the prevailing outdoor conditions can cause damage to the plants
 - **Hot summer**
 - **Cold winter**
- **In the summer**, avoid placing plants in a car with the windows shut, because temperatures will rise and destroy the plant in a short period of time. Shade the plant from direct sun while it is in the car; this is especially true for shade-loving plants.

- **During winter months**, wrap plants thoroughly before
- wrap plants thoroughly before leaving the store to carry them to your car.
- Wrap plants thoroughly with newspaper or paper bags,
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- Many foliage plants will be damaged considerably if the temperature drops below 50°F, so maintain as warm a temperature as possible around these plants during transport.

Acclimatization

- Tropical plants grown in full sun have leaves (so-called **sun leaves**) that are structurally different from the leaves of plants grown in shade (**shade leaves**).
- Sun leaves have fewer chloroplasts, and thus less chlorophyll. Their chloroplasts are located deep inside the leaves and the leaves are thick, small, and large in number.
- Shade leaves have greater numbers of chloroplasts and thus more chlorophyll, are thin, large, and few in number.

- When plants are grown in strong light, they develop sun leaves that are photosynthetically inefficient.

Containers

- There are many types of containers from which to choose.

Containers may be made from ceramics, plastic, fiberglass, wood, aluminum, copper, brass, and other materials.

A good container should be ,

- Large enough to provide room for the root ball and root growth,
- It should have sufficient room above the medium (soil) line for proper watering, provide bottom or side drainage, and be attractive.

- container with drainage holes that is about a third larger than the old container.
- If the container was previously used, then give it a thorough washing to remove soil and potential contaminants.
- If there are plant disease organisms on the pot, then dip it in a solution of 1 part liquid bleach to 9 parts water and rinse thoroughly.

Clay and Ceramic Containers

Unglazed porous and glazed clay pots with drainage holes are widely used.

- Unglazed clay pots absorb and lose moisture through their walls. It provide excellent aeration for plant roots
- Ceramic pots are usually glazed on the outside, and sometimes on the inside.

- Make sure to place some stones or some other structure on the bottom of the hole-less container to keep the conventional container about an inch above the bottom of the hole-less container. This will allow irrigation water to drain from the conventional container.
- Unless you have a very small plant, avoid using small novelty containers, as they have little room for medium and roots, and are largely ornamental

Plastic and Fiberglass Containers

- Plastic and fiberglass containers are usually quite light and easy to handle
- relatively inexpensive and often quite attractive in shape and color.
- Plastic pots are easy to clean and sterilize for reuse
- they are not porous, they need less frequent watering and tend to accumulate fewer salts.

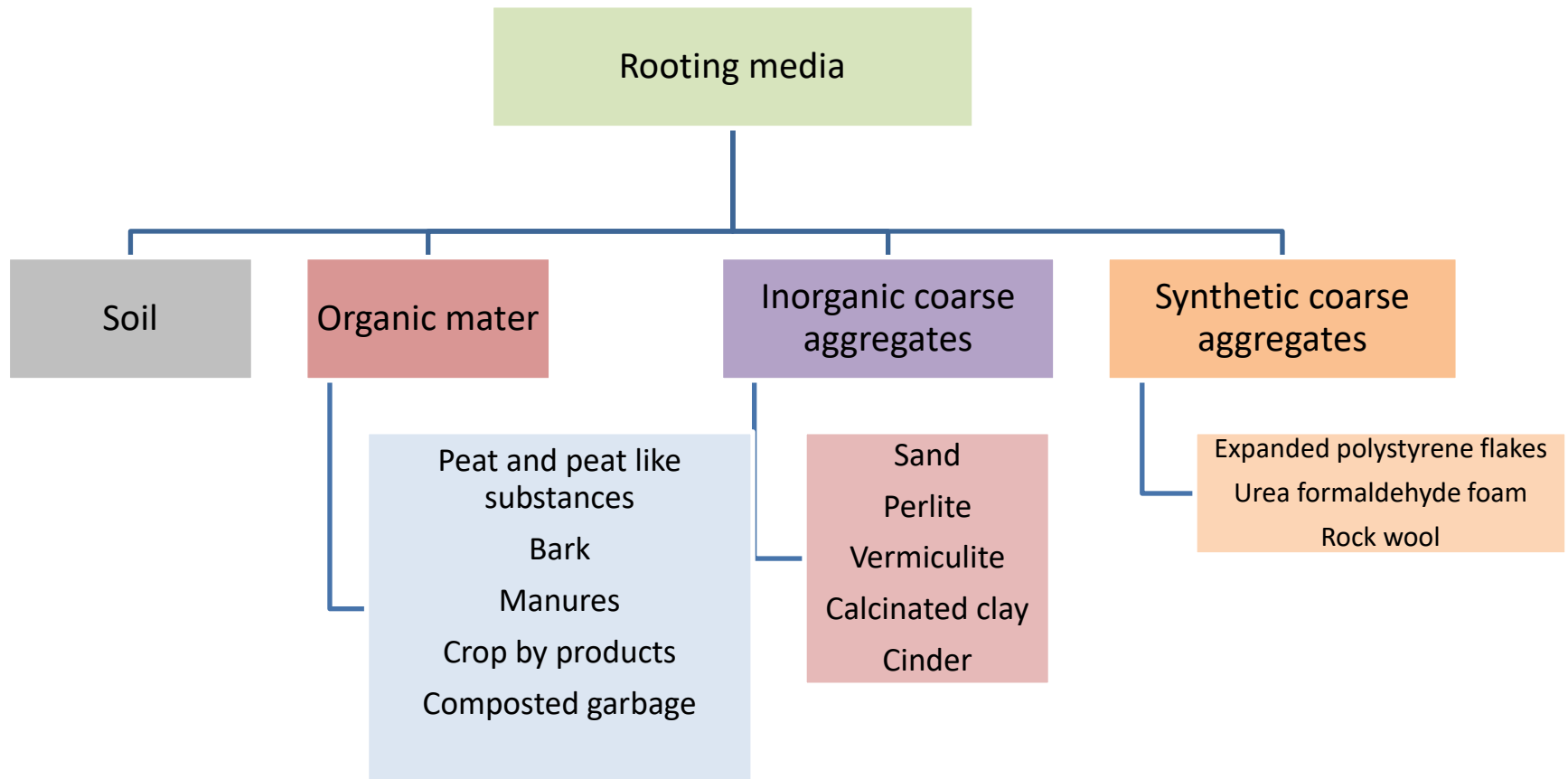
Potting Media

- Plants have a lifespan, just as people do
- unhealthy plants attract insects like a magnet, and when the infestation spreads
- plants, such as cinerarias, poinsettias, chrysanthemums, azaleas and cyclamen, make wonderful indoor decorations, but in most cases they should be discarded after they have finished flowering
- Cactus, succulents and rosemary, for example, prefer a coarse, well-drained soil that is about one-third sand.

- African violets and ferns prefer soil with a high humus content, which can be achieved by adding leaf mold or shredded bark
- Many kinds of orchids are happiest growing in nothing but fir bark or sphagnum moss.
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- A good indoor potting mix is usually composed of peat moss, vermiculite and perlite.
- These soilless mixes absorb moisture very well and resist compaction, but they tend to dry out very quickly
- One advantage to a soilless mix is that it is sterile, so there is no chance of introducing pest or disease problems.

Components of Rooting media



a. Soil

- Combination of sand, silt, clay and organic matter
- **Clay**
 - Finest in size (0.002 mm)
 - Responsible for phy. And chem properties of soil
 - Carry –ve charge and reacts with charged particles
 - More clay in soil more WHC but have drainage and aeration problem

Silt

- Vary in dia. from 0.002-0.05 mm
- Greater chemical activity than sand
- Have poor drainage
- Can not be useful as RM with out sand, clay and OM

Sand

- Range in size from 0.5-2 mm
- Large pore spaces
- Low Nutrient and WHC

Organic Matter (OM)

- Increase WHC of soil



b. Organic matter

Following materials are used as the organic matter components for growing media

1. Peat and peat like structures
2. Bark
3. Sawdust
4. Manures
5. Crop byproducts
6. Composted garbage

1. Peat and peat like structures

Peats are formed by accumulation of specific plant material in poorly drained locations.

Classified into following types:

- a) Sphagnum moss peat
- b) Reed and sedge peat
- c) Humus peat
- d) Hypnum peat

Peat moss

- is an accumulation of partially [decayed vegetation](#) or [organic matter](#).
- It is unique to natural areas called [peatlands](#), [bogs](#), [mires](#), [moors](#)
- Peat is a spongy substance which is an effect of incomplete decomposition of plant residues in different stages of decomposition. Between the several organic matters which are used as substrate for horticultural plants cultivation in soilless conditions, peat is the unabandonable ingredient for mixtures for commercial production of plants. Peat is used in horticulture as a component of garden plant substrates

- It keeps water and nutrients, and gives them steadily to plants. It has air pockets or pores to supply oxygen to plant roots and allow for drainage.
- Peat is one of the most important growing medium that is safe and cost-effective used in the production of horticulture plants

a. Sphagnum moss peat

- Most popular as RM
- Consists of 75% partially decomposed stem and leaves of Sphagnum moss
- It is elastic and spongy
- It do not give and take nutrients to the soil
- Acidic in nature but amended by lime application
- No change in composition occurs after pasteurization



Sphagnum moss peat



b. Reed-sedge peat

- Brown to reddish brown in colour and form from swamp plants like reeds, sedges, marsh grasses and cattails
- WHC is less than that of peat moss
- pH varies from 4 to 7.5 and can be used for pot and bench crops if pH is properly adjusted



Reed and sedge peat

c. Peat humus

- Dark brown to black in colour and most highly decomposed of peat
- Derived from hypnum peat moss or reed- sedge peat and original plant remains are not distinguishable
- WHC is less than other peat
- pH range from 5 to 7.5
- N contents are high which is toxic to seedlings
- It is rarely used in greenhouse



d. Hypnum

- Partially decomposed *Hypnum* moss species (Hypanaceae family)
- If used with vermiculite no limestone is needed



2. Bark

- Redwood bark, pine bark and fir bark are mostly used
- It does not possess good WHC and Nutrient retention capacity



Bark

3. Sawdust

- Similar to bark
- Used in partially composted form as it contains toxic substances like resin, tannins or turpentine
- Even after composting sawdust decomposes at a faster rate than bark, and because of wider C:N ratio(1000:1) a greater amount of N tied up in the rooting media
- Sawdust also require limestone as it is acidic in nature even after decomposing with additional N
- It continues to decompose during use so requires additional limestone as time passes



4. Manure

- Used as potting material until middle of this century
- Ammonia toxicity common after heat treatment
- High CEC and a good nutrient reservoir
- High WHC
- Used in moist state and is heavy in weight, so is not popular as shipping media
- Cow manure and poultry manures are mostly used

5. Crop by products

Straw

- Must be chopped into 3 inch pieces
- Decompose rapidly needs 2-3 applications per year
- Previous year crop can also be used as rooting media but after well decomposition and pasteurization as it may contains diseases

Other crop by products includes:

Peanut hulls

Bagasse (sugarcane fiber)

Rice hulls



Rice hulls

6. Composted garbage

- Kitchen disposal and solid household trash can be used as rooting media after decomposition
- The action of micro organism during decomposition produces heat which destroy harmful microorganisms and result in dark brown granular products
- pH is about 8.5 and the salt contents is moderately high

c. Inorganic coarse aggregates

- Added to root media to increase porosity
- Improve drainage
- Improve air movement
 - a) Sand
 - b) Perlite
 - c) Vermiculite
 - d) Calcined clay
 - e) Cinder

a. Sand

- Low in nutrients and WHC
- Chemically inert

b. Perlite

- Produced from crushed alumina-silica volcanic rock
- Irregular surface can retain water
- Sterile with pH 7-7.5
- Chemically inert and does not have cation exchange capacity
- On mixing, it loosens the soil mixture, does not decay and reasonably resistant to abrasion



Sand



Perlite

c. Vermiculite

- High nutrient and moisture holding capacity along with high cation exchange capacity
- Contains large amount of K and Mg
- Not durable and compressed easily in wet conditions
- Light in weight and serve as excellent. RM



Vermiculite

d. Cinders

- Are porous and light
- Contains large quantity of easily leached sulphates
- Requires extensive leaching before mixing with root media for crop production



Cinders

e. Calcined clay

- Porous and retain large quantities of nutrient and water
- Provide limited amount of nutrients for plant growth
- It create large pore spaces which are durable and stable



Calcined clay

d. Synthetic coarse aggregates

- Several plastic material are being used as one of the ingredient of root media
- May be byproduct of plastic manufacturing or prepared especially for the use as root media
- Efficiently used as substitute for sand or perlite in a mixture prepared with sphagnum moss peat or pine bark.

Some of them are:

1. Expanded polystyrene flakes
2. Urea formaldehyde foam
3. Rock wool

1. Expanded polystyrene flakes

- By-product of polystyrene bead processing
- Odorless, chemically neutral and decay resistant
- Do not absorb water internally and hold a small quantity of water on the surface of the particle.
- Improve drainage, aeration and decrease bulk density of growing medium



2. Urea Formaldehyde Foam

- Especially prepared by mixing air with liquid resin and allowing the mixture to cool under controlled temperature
- These are available in 2000 L sacks in 50 cm x 50 cm x 100 cm blocks.
- Foam particles are like sponge and hold large quantity of water
- pH of foam is 3 and decrease if particles are subjected to decompose



3. Rock wool

- Granular and high WHC
- Slightly alkaline
- Negligible CEC
- Neither contributes or hold nutrients can be used with other rooting media like sphagnum peat moss

