

## Types of Media and Characteristics

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### SUMMARY

All potting mediums are not created equal. Just as in nature, plants such as succulents require different soil than ferns. Different potting mixes were formulated to respond to those needs. Knowing what's in your potting soil will allow you to give your plants what they need in order to be healthy and perform their best. Here different types of media has been explained with their characteristics and properties.

### INTRODUCTION

Media used for propagation of Horticultural plants mainly consists of organic and inorganic components. The components of organic media include peat, sphagnum moss or bark. Sometimes leaf mulch, wheat straw, paddy straw, paddy hulls and saw dust are also used. While using these components some coarse mineral components should be used for increasing aeration such as sand, grit, pumice, vermiculite, perlite etc. The characteristics of different medium used for propagation are as under.

#### Soil:

- The soil texture and structure is the first deciding factor for preparations of soil media.
- A soil having 40 percent sand, 40 percent silt and 20 percent clay is considered best for seed germination, whereas sandy loam soils are excellent for preparation of soil mixtures for container growing plants.
- The soil pH of 5.5. to 6.5 is generally preferred. On the other hand structure of soil plays vital role in the germination of seed and rooting of cuttings
- Heavy soils are avoided, as working with such type of soil is quite difficult.



#### Sand:

- Sand contains silica and has almost no mineral in it. Quartz sand, which chiefly contains silica components, is used by nurserymen for propagation. Because sand is the heaviest of all rooting media, it should be used in combinations with some other organic material.
- Sand should be washed, fumigated or heat treated before use to kill harmful pathogens present in sand.



**Vermiculite:**

- It is a micaceous mineral obtained from mica ore after processing the ore at 1090oC.
- Sterilization of material is done by heating. Heating turn water to steam, popping the layers apart forming small, sponge like kernels.
- Chemically, it is hydrated magnesium-aluminum-iron silicate. It is neutral in reaction with good buffering property and insoluble in water.
- It can absorb large quantities of water. It has good cation exchange capacity and can hold nutrients in reserve and release them slowly. It contains enough magnesium and potassium, which is needed for plant growth.



Horticultural vermiculite has four grades according to the size of particles:

Name of grade Particle size (mm)

No 1	5-8
No.2	2-3
No 3	1-2
No 4	0.75-1

In general NO.2 grade is widely used as horticultural grade and No.4 is useful as seed germinating medium. Nurserymen should not use non-horticultural grades.

**Compost:**

It is decomposed and rotten material of farm waste. For growing seeds and cuttings it is very common and useful material. Compost is rich in organic matter, nutrients or has higher water holding capacity. It can be used as a medium for propagation but should be mixed with soil. The whole process of compost making occur in three steps.

1. Decomposition of easily degradable material, which is for few days.
2. Cellulose compounds are degraded at a high temperature which takes several months.
3. The micro-organisms recolonize the material.

Mostly, compost is prepared using dung which contains faecal pass out, living seed of weeds and may be infested with soil dwelling pests like beetles, grubs and root-rotting pathogens. Therefore, it should preferably be used after sterilization

**Perlite:**

- It is grey-white siliceous material obtained after processing of crude ore which appears, after volcanic eruption.
- Perlite is obtained after heating the crushed ore to about 760oC. As a result of heating, the moisture in the particle changes to steam and expand the particles to small, sponge like kernels that are very light. It holds 3-4 times more water to its weight.
- It is neutral in reaction with a pH of 6.0 to 8.0. It does not contain mineral nutrient. Perlite in combination with peat moss is a very popular rooting medium for cuttings.

- Perlite is available in different grades with particle size of 1.6 to 3.0 mm in diameter is mostly used for propagation. In combination with peat moss it is an ideal rooting medium for rooting of cuttings.



### Peat:

Peat consists of the decomposed remains of aquatic, marsh, bog, or swamp vegetation and sediment of water bodies. Peat is of three types:

**Moss Peat:** It is least decomposed and derived from sphagnum or other mosses. It has high moisture holding capacity about 15 times to its dry weight. It varies in colour ranging from light tan to dark brown. It has highly acidic pH (3.2 to 4.5) and contains little amount of nitrogen. This type of peat is mostly used in horticultural nurseries, the coarse grade being the best. When peat moss is to be used in mixes as a propagation medium, it must be broken down into pieces and moistened before use. However, its continuous use may be improved by using agents like Agro Grow.



**Reed sedge peat:** It consists of remains of grasses, reeds sedges and other swamp plants. It holds about 10 times more water to its dry weight and its pH ranges from 4.0 to 7.5.

**Peat humus:** Peat humus is highly decomposed material. It can originate from hypnum moss or reed sedge peat. It has very low moisture holding capacity and pH ranges from 2.0 to 3.5. It may contain latent seed inoculations of soil dwelling pathogens, so it should be pasteurized while using.

### Sphagnum moss:

- It is a bog grass plant of the genus *Sphagnum* such as *Sphagnum papillosum*, *S.capillaceum* and *S.palustre*.
- It grows as lithophytes in swampy spheres and is commonly found in hilly tracts of India. Sphagnum is obtained after dehydrating living portion of the grass. Sphagnum moss is relatively sterile, light in weight, having high moisture holding capacity.
- It has pH of about 3.5 to 4.0. It is widely used for keeping the live material moist for distant transport of seedlings and in air layering (goottee) of plants.
- It can be used as rooting medium for cuttings. Moss should be shredded either by hand or mechanically before use.
- It should be moistened with water before use. Sometimes, moss contains a strain of *Streptomyces* bacteria, which inhibit damping off the seedlings in the nursery.



### Saw dust, wood-shaving and shredded bark:

- Saw dust, wood shavings and shredded bark of different plants like cedar, fir, pines, maple and redwood etc. can be used in mixtures with various propagating medium.
- Because of low cost, light weight and easy availability, these are mainly used in soil mixes for container grown plants.
- These mixes usually contain a lower amount of nutrients and hence additional amount of nutrients may be added to the mixes before their use as a growing medium.
- Being organic in nature, saw dust is ideal for the growth of fungus and hence its use is limited in propagation.



Saw dust



Wood-shaving

### Coco peat:

- It is also called as coco dust. It is a byproduct of cutting and shifting of coconuts for fibre production.
- It is becoming very popular propagating and growing medium these days, because it has an excellent pore space (25-30 per cent) and fine structure required for proper growth and development of seedlings.
- It is a rich source of nutrients and can easily be mixed with other growing media.



**Soil mixes:**

- Different soil mixes are used as medium for propagation. Usually, soil mixtures are prepared by mixing sand, loam soil leaf moulds in different proportions.
- Ideal soil mixtures should be porous and should have good water holding capacity.
- Soil mixtures are not only used as propagation medium for seed germination or rooting of cuttings but also for filling of containers.
- The success of these mixes lies in the proportion and thorough mixing of the ingredients

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