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Center for Smart Agriculture

Protected floriculture



Module 2: Components Pre-requisites for protected cultivation of flower crops

Session 11: Types of growing media



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- Growing the horticultural crops in the media other than the soil is called soil-less media.
- Soil mixes used for greenhouse production of potted plants, cut flowers & vegetables are highly modified mixtures of soil, organic and inorganic materials.



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- When top soil is included as a portion of the mixture, it is generally combined with other materials to improve the water holding capacity and aeration of the potting soil.
- Many greenhouses do not use topsoil as an additive to the soil mixes, but rather use a combination of these organic and inorganic components as an artificial soil mix.



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Advantages

- Growers who do not have their own field are also able to grow crops.
- Soil-less culture media is free from pathogens and nematodes.
- It provides good aeration and drainage.



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- Nutrient control: complete analysis of soil-less culture media is possible, which economizes the fertilizer use.
- Labour economics: Less handling time, sterilization, weeding, fertilizer application and watering.
- The light weight of soil-less substrates reduces the cost of transportation.



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Peat: Consist of remains of aquatic, marsh bog or swamp vegetation, preserved under water in partially decomposed state.

- Stable source of organic material that holds a great deal of water and air.
- It is quite acidic (pH-3.5 to 4.0) and limestone added to adjust the pH.



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Peat



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Perlite:

- Grey white siliceous material of volcanic origin mined from lava flow.
- It is neutral in Ph and negligible cation exchange capacity.
- Although cost are moderate but it is effective amendement for growing media.



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Perlite



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Vermiculite:

- It is micaceous mineral, expands markedly when heated.
- It is hydrated magnesium-aluminium-iron silicate.
- It is light in weight, neutral in reaction and insoluble in water.



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Sphagnum moss:

- It is hydrated remains of acid bog plants such as *Sphagnum pappilosum* and *Sphagnum palustre*.
- It is sterile and light weight with high water holding capacity. It is able to absorb water 10 to 20 times of its weight .
- It contains small amount of minerals.



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Sphagnum moss



Vermiculite



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Leaf mould: Leaf types of maple, oak, sycamore and elm are suitable for leaf mould.

- After composting of leaves to 12 to 18 months , leaf mould is ready for use.
- It may contains nematodes as well as seeds or noxious insects and diseases, so it should be sterile before use.



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Bark: It is partially composted and screened material of plant origin.

- It is beneficial to obtain bark from local sources to avoid cost of transport.

Rockwool: Produced by burning a mixture of coke, basalt, limestone and possibly slag from iron production.



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- Composition is 60% basalt, 20% limestone, 20% coke.
- It is formulated to prescribe higher density to provide the air and water holding requirements of plants.



Rock wool



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Polystyrene Foam: It helps in bringing improved aeration and light weight to root substrate.

- Consist of white synthetic product containing numerous closed cells filled in air. It is extremely light in weight, does not absorb water and has no appreciable CEC.



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Polystyrene foam



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Sand:

Basic component of soil, particle ranges in diameter 0.05mm-0.25mm.

- Least expensive among all inorganic amendements.
- The heaviest which may result in prohibitive transportation cost.



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- **Rice hulls:** By products of rice milling industry. Extremely light in weight and very effective in improving drainage.



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Calcinated clays: These are formed by heating montmorillonite clay minerals.

- The pottery like particles formed is six times as heavy as perlite.
- They have relatively high cation exchange as well as water holding capacity.
- They are very durable and useful amendment.



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Bagasse:

- It is a waste by product of sugar industry.
- It may be shredded and or composted to produce material which can increase the aeration and drainage properties of container media.



Bagasse



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Coco-peat:

- It is a by product of coconut husk. After grinding the husk, coco peat is ready.

Sawdust and shavings:

- These are by product of lumber mills.
- It is close to neutral in pH when thoroughly composted.



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Thank you...