Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 02, Issue: 04 (JULY-AUGUST, 2022)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

# Soilless Media for Cultivation of Ornamental Plants

(*Raveena[1], Arvind Malik[2], Divya[2] and Monika[2])
[1]Deptt. of Horticulture, Maharana Pratap Horticulture University, Karnal-132001
[2]Department of Horticulture, CCS Haryana Agricultural University, Hisar-125004
*Corresponding Author's email: sainiraveena28@gmail.com

With or without the use of an inert medium or organic growing media to provide mechanical support, soilless culture is a method for growing plants in nutrient solutions that give all the nutrients necessary for optimum plant growth and development. For the development of flower crops such as roses, gerbera, lilum, gladious, tuberose, carnations, and even asparagus, soilless culture, i.e. perlite, compost, vermiculite, cocopeat, peat moss, rice hull, and vermicompost, is utilised. The different crops cultivated in different soilless culture media provide plants with an optimum rooting medium and defence against fungus and root diseases. Growing media, which can be organic or inorganic, is a substance that anchors the roots of plants and holds enough water that is readily available.

## Types of soilless culture

**1. Organic growing media** - Organic growing medium additives are typically made from plants or plant products that are found naturally or are leftovers from manufacturing facilities. Utilizing organic amendments is mostly done to loosen the soil and enhance pore size. These media offer drainage, useable water storage, fertilizer storage, and a reduction in growing medium weight.

**Peat moss:** Peat is made from the submerged remnants of aquatic, marsh, bog, and swamp plants. It develops when partially degraded plant matter gathers below the surface of the water in regions with low temperatures, little oxygen, and little nutrient content. It is remarkably uniform, appealing, safe to handle, great at storing both air and water, and typically weed- and pathogen-free.

**Coconut Coir:** It is known by various trade names like Ultrapeat, Cocopeat and Coco-tek. It combines the water retention of vermiculite with the air retention of perlite. It is a completely organic medium made from shredded coconut husks. Additionally, coir is an entirely renewable resource, in contrast to peat moss, which is quickly running out due to abuse.

**Vermiculite:** Magnesium and potassium are both present in this molecule. It is less durable than certain other mediums, such as sand and perlite, but it stores a lot of water and helps with drainage and soil aeration.

**Compost:** Organic material that has undergone both aerobic and anaerobic decomposition is considered compost. Biodegradable organic wastes are converted to stable humus through the composting process by local bacteria, fungus, and actinomycetes. Compost offers an abundant growing medium, nutrients to the plants or a porous, absorbent material that holds moisture and soluble minerals.

**Vermicompost:** Worm castings, worm humus, and worm manure are other names for vermicompost. It is described as the byproduct of the earthworm's digestion of organic substances. This compost is an odourless, spotless organic substance rich in micronutrients necessary for plant growth as well as sufficient amounts of N, P, and K.

**2. Synthetic growing mediums** - Vermiculite, perlite, tyre fragments, pea gravel, and sand are examples of inorganic materials. In general, they are more expensive than organic amendments because they must be purchased. Increased aeration, improved drainage, reduced excessive water holding capacity, and increased or decreased weight are all achieved with inorganic amendments.

**Sand:** For plants that demand a dry environment with loose soil, sand is a beneficial growing medium. Water that is too much will run off instead of soaking into the sand.

**Perlite:** Perlite is the most popular form of media used in containerized soilless culture systems. Small to large bags of this medium are sold by merchants to be added to growing media to improve soil drainage and aeration.

**Charcoal:** Charcoal is the dark residue made up of impure carbon that results from the removal of water and other volatile components from animal and plant materials. It is created by slowly heating materials like wood, sugar, bone char, or other materials without oxygen. It frequently serves as potting soil for cultivating orchids.

**Vermiculite:** Chemically, it is an aluminum-iron silicate hydrate of magnesium. Certain basaltic minerals are the major constituents of vermiculite. It has high exchange and buffering properties as well as the ability to supply potassium and magnesium, making it a desirable growing medium for hydroponics. Vermiculite is less resilient than sand and perlite, though.

## Positive aspects of soilless media

- It gets better High water holding capacity is provided through aeration and drainage.
- It makes nutrients and moisture easily accessible to plants.
- Its pH is about neutral (6.5 to 7.5).
- It acts as an insulator to lessen excessive variations in soil temperature.
- It is clean, light in weight, odourless, and safe to handle.
- It is sterile and free of weeds and illness.

## Use of soilless media in ornamental plants

| S. No. | Cut flower crops | Growing Media Used (In Different Combinations) |
|---|---|---|
| 1. | Rose | Perlite, Zeolite and Cocopeat |
| 2. | Cut Roses | Rockwool, Pinewood chips, Particles of used rockwool |
| 3. | Vanda | Brick pieces, Charcoal, Coir dust |
| 4. | Tuberose | Coco peat, Perlite, Farm yard manure, Compost |
| 5. | Orential lily | Sand, Sawdust, Vermiculite, Moss |
| 6. | Gerbera jamesonii | Cocopeat, Perlite, Vermicompost, Compost, Rice husk |
| 7. | Lilum | Soil and Cocopeat |
| 8. | Tulip | Soil, Saw dust, Poultry manure, Sheep manure |
| 9. | Dianthus caryophyllus | Soil, FYM, Sand, Cocopeat, Sawdust |
| 10. | Gladilous | Sand, Silt, Clay, Leaf mould |
| 11. | Chrysanthemum | Sand, Soil, FYM, Leafmould, Sawdust |

## Soilless Culture's Restrictions

Although soilless culture offers numerous benefits, it also has certain drawbacks. Application on a commercial scale necessitates technical expertise and greater start-up costs. Solution preparation, pH and Ec regulation, nutritional deficit assessment and treatment, guaranteeing aeration, maintaining favourable conditions inside protected structures, etc. all require a high level of management abilities. The control of plant health must be done with great care. The soil-less culture is only used for high-value crops grown in the region because to the prohibitively high cost.

## Conclusion

Due to their strong water-holding capacity, aeration, increased uptake of nutrients, and better management (including greater plant resistance) of diseases and pests, the use of soilless medium has been shown to be helpful for increasing the production of floricultural crops. The growth of ornamental plants has been discovered to be suited for a variety of growing media, including sand, peat, perlite, rockwool, sawdust, cocopeat, compost, etc. in various combinations. In some nations, particularly in those that engage in the commercial cultivation of ornamental plants, soilless culture is increasingly widespread and recognised. Although the initial startup expenses of putting up soilless culture are currently a barrier, costs will eventually go down as with all technologies, making this option far more practical. This method has yet to gain acceptance among gardeners in poor nations.