

Vertical Gardening in Ornamental Horticulture

J Prabu*

Assistant Professor, Department of Horticulture, Palar Agricultural College, Vellore,
635805

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Abstract:

Utilizing the vertical area through growing with upright structures is known as vertical gardening. It is perfect for gardening in urban areas and in balconies of residences. You may make vertical gardens with a variety of structures, such as walls, arbours, trellises, and fences. The utilization of pulley systems and hanging plants can add appeal to vertical gardening.

Introduction:

Vertical gardens are those that use a variety of plant species to cover the exterior walls. In different parts of the world, they are also known as vertical or living walls, biofacade walls, green space walls, wall gardens, green wall technologies, green scaffolding, bio walls, green façades, and so on (Bakar et al., 2013, Amir et al., 2014, Rahman et al., 2014, Jim, 2015, Basher et al., 2016). With 54% of the world's population living in urban regions, there are more people living in urban areas than in rural ones worldwide. These advantages include the possibility for urban heat islands (UHI), carbon sequestration and its computation methods. In the upcoming years, urban growth—including the number of people and buildings—is expected to accelerate dramatically. Urban communities will encounter a number of continuing and new issues pertaining to food, education, the economy, the environment, and health. Increased utilization of greenspace has been proposed as a way to address both adaptation and mitigation for urban areas. This technique has been examined in a variety of research using analytical, empirical, or numerical methodologies. With just a general classification of the types of greenspaces, these tend to concentrate on land use changes at the city or regional level. Thus, a more high-quality green environment and enormous possibilities for green space are being created by this fast urbanization. Urban landscaping is getting more and more popular these days as people realize how important it is to keep their surroundings clean and green and as a way to increase the amount of green space in cities. According to Ghazalli et al. (2019), urban green spaces benefit the environment and the well-being of the urban population by lowering noise levels and improving ambient conditions, which in turn improves human health.

Types of Vertical Gardening:

1. Green Façade

- One kind of green wall system is called a "green facade," where specifically made supporting supports are covered with climbing plants or cascading groundcovers.
- Either the ground or raised containers are used to cultivate plants, where they receive fertilizer and water.
- One kind of green wall system is called a "green facade," where specifically made supporting supports are covered with climbing plants or cascading groundcovers. rooted in the ground, in planters in between, at the foot of these structures, or even after reaching complete covering. Green facades can be constructed as independent structures like columns or fences, or they can be fixed to existing walls.

2. Living or Green wall

- A living wall system that is attached vertically to a structural wall or frame and consists of pre-planted panels, vertical modules, or planted blankets. These panels, which can be composed of synthetic fabric, expanded polystyrene, or plastic, can sustain a wide variety of plant species, such as a verdant mix of food plants, ground coverings, ferns, and perennials.
- Made from vertical modules, pre-planted panels, or planted blankets (vegetated mat wall) that are fastened to a wall or structural structure. constructed to accommodate a range of plant species' diversity and density using steel structure, plastic, expanded polystyrene, and synthetic cloth. Compared to ground-planted green facade systems, they often require more upkeep, such as fertilizer and water.

Plants suitable for vertical garden:

1. **Indoor plants:** Peperomia, Syngoniums, Philodendron, Epipremnum, Begonia, Anthuriums, Nephrolepis, Chlorophytum, Lantana, Pilea, Rheo discolor, Cuphea, Fittonia, Spathiphyllum, Schefflera
2. **Outdoor Green walls/ For shaded areas:** *Asparagus spp.*, *Pilea microphylla*, *Alternanthera*, *Mentha spp.*, *Jade plant*, *Sedums*, *Portulaca*, *Dusty miller*, *Cuphea*, *Baby's tear*, *Callisarepens*, *Ophiophogon*, *Dianellatasmanica*

**General considerations:**

Appropriate watering schedule; careful selection of wind-prone regions (hardy and succulent plants); removal of dried leaves; maintenance of a clean structure; disposal of water from drainage system; pruning when required; and prompt fertilizer application

Benefits of Vertical gardening:

- Visual appeal
- It serves as natural insulation for hot and cold air and saves energy for your building
- It lowers CO₂ levels, raises oxygen, and improves air quality
- It conserves water and requires less work to water
- It absorbs sound and noise
- It increases thermal insulation and energy efficiency
- It protects buildings from extreme temperatures, extending their lifespan
- It lessens the urban island heat effect
- It retains rainwater, giving wildlife food and shelter

Conclusion:

Vertical farming reduces waste and the amount of water and land used. Crops are also protected against pests and illnesses since they are cultivated in a controlled environment. Compared to ordinary farming, vertical farming uses 70–95% less water. There are no pests or illnesses since vertical farming requires 90% less soil, or none at all. Organic and pesticide-free food is produced without the use of pesticides.

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