

Role of Container Gardening in Urban Greening

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Rapid urbanization has increased the importance of green infrastructure for sustainable living. Container gardening offers a practical solution for limited urban spaces by enabling households to grow fruits and vegetables. This micro farming approach enhances food security, improves health, supports environmental sustainability and contributes to household income and overall well-being.

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Introduction

Urban regions are currently seeing a significant increase in human population, so green infrastructure is becoming more crucial for societal sustainability. Green infrastructure can be defined as “natural, semi-natural, and artificial networks of multifunctional ecological systems within urban areas”. Container gardens are an important component of green infrastructure in many cities. Additionally, container based systems are occasionally the only type of gardening accessible in crowded cities where the soil is mostly covered with hard surfaces, creating intense competition for limited space.

A micro model of farming where a family unit or household is producing fruits and vegetables in special containers for personal consumption to help improve the income, health, and well being of its family members.

The biggest advantage of growing plants in containers at home is that they are right outside your door. The community benefits of growing food at home are less visible, but they are nevertheless considerable, as we will discover. The ability to grow at home will be determined by the size and compatibility of the growing place. Many small places can be extremely fruitful, but keep in mind that container gardens are less ideal for space hungry crops like parsnips and Brussels sprouts, and they require more frequent tending than allotments.

Whether you want to start by growing just a few tasty herbs and vegetables in pots, an attractive fruit tree and some edible flowers, or to turn your whole growing area over to food production, there are three clear stages in turning any dream into an edible reality: survey, design, and implementation (Fig 1).



Fig.1: Urban container gardening system for vegetable production in a limited space

Survey

First, you need to survey your site and your family. What do you like to eat? What would you like to try? How much food would you like to produce? How much time and energy are you willing to spend, and how much money? It will lend itself to growing some plants with ease, but some may struggle. Make a list of the plants that offer you the best value. If you are planning some permanent beds, make sure you include a balance of roots, summer and winter vegetables, salads and leafy greens, so you can rotate the crops each year to keep your soil fertile.

Design

Spend a few evenings and wet weekends designing your project on paper. The design process is actually very straightforward. The most important factor of all is location even if you are only going to plant a few containers with food plants, you need to put them where they will have the best chance. Tender plants may need protection from the heat of a summer's day, as well as from frost. Design to overcome the problems of a windy corner or a shadeless site.

Implementation

Once you have decided what you are going to grow, and how and where you are going to grow it, you can transform your growing space into a productive system. To get the most from a small space, you will almost certainly need to make some structures, so make a list of all the materials you will need: containers, compost, wood, nails, screws and so on and split any construction work into projects that will take, say, half a day for two people. You can green your corner, however humble, and your first steps may inspire others towards a vision of edible greenness, wherever they live.

When to start growing

Traditionally, the growing season kicks off in early spring. If you're new to growing, it's easy to feel under pressure to sow seeds straightaway. But when the weather is cold, the

days are short and light levels are low, it's harder to coax seeds into life and raise healthy plants. It's much easier in the warm, brighter days of late spring and early summer. Even mid-summer or early autumn is not too late to start. There is, of course, nothing wrong with starting seeds in early spring: just bear in mind that it does get easier later in the year.

What to grow

In a container, almost any vegetable, flower, herb, shrub, or small tree can thrive. Dwarf and compact varieties are ideal for small pots. Choose plants that are appropriate for the climate and the amount of sun or shade that the container will receive. Individual containers can be used to raise vegetables, ranging from huge pots to 5 gallon buckets or half barrels, the largest of which can hold a single tomato plant or numerous smaller vegetables like broccoli or cabbage. Container gardening is best suited to dwarf or shrub varieties of bigger vegetables such as tomatoes, pumpkins, and winter squash. Themed gardens are also enjoyable to explore. Plant a colourful salad garden with lettuces, miniature tomatoes, chives, and parsley. Edible flower plants in a pot, such as petunia, pansies (*Viola wittrockiana*), and nasturtiums (*Tropaeolum majus*). Look for warm-weather annuals that bloom throughout summer or have foliage that stays appealing. Geraniums, marigolds, wax begonias, coleus (*Solenostemon scutellarioides*), scarlet sage (*Salvia splendens*), and flowering tobacco (*Nicotiana spp.*) are also excellent options.

Soil mixture

The planting medium is an important factor in "container gardening" success. A precise soil composition is required for container gardening. First and foremost, the growing medium must be permeable in order to allow enough oxygenation of the plant roots. A porous structure will also allow for good drainage, reducing the possibility of waterlogging and consequent rotting of plant roots. The optimum soil mixture is dark brown in colour and resembles chocolate cookie crumbs. The optimal growing medium is a mixture of 3 parts loam soil, 1 part compost or composted manure and 1 part rice hull or coconut husk.



Fig. 2: Types of containers and the grow bag system used in container gardening

Choosing containers

Vegetable plants can be grown in almost any container. Try utilizing bushel baskets, drums, gallon cans, tubs, or wooden crates (Fig. 2). The container size will vary depending on the crop and available space. Green onion, parsley, and herbs can be grown in pots ranging in size from 6 to 10 inches. Most vegetable crops, such as tomatoes, peppers and eggplant, require 5 gallon containers, although chard and dwarf tomatoes require 1 to 2 gallon containers. Herbs, lettuce, and radishes benefit from smaller container sizes. They are relatively easy to handle and provide ample area for root growth. Porous or nonporous container materials are available. Nonporous containers include glazed, plastic, metal, and glass. For successful yields, regardless of the type or size of container used, it must drain effectively. Adding around 1 inch of coarse gravel to the container's bottom will help drainage. Drain holes work best when placed along the container's side, around $\frac{1}{4}$ to $\frac{1}{2}$ inches from the bottom.

Table 1: Planting information for growing vegetables in containers

Crop	Number of days for germination	Number of weeks to optimum age for transplanting	General size of the container	Amount of light required	Number of days from seeding to harvest
Beans	5-8	-	Medium	Sun	45-65
Cucumbers	6-8	3-4	Large	Sun	50-70
Eggplant	8-12	6-8	Large	Sun	90-120
Lettuce leaf	6-8	3-4	Medium	Partial Shade	45-60
Onions	6-8	6-8	Small	Partial Shade	80-100
Parsley	10-12	-	Small	Partial Shade	70-90
Pepper	10-14	6-8	Large	Sun	90-120
Radish	4-6	-	Small	Partial Shade	20-60
Squash	5-7	3-4	Large	Sun	50-70
Tomato	7-10	5-6	Large	Sun	90-130

Conclusion

The container gardening has the potential to be an important component of urban green infrastructure. Container gardening can contribute to various kinds of ecosystem services in urban areas. Citizens need to be aware that they can contribute to improving the urban environment, although much container gardening may be done as a hobby.