

Rooftop Cultivation of Fruit Crops In India

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Abstract

Urbanization in India threatens agriculture, demanding solutions. Rooftop farming emerges as a promising answer, offering fresh fruit, cooler cities, and community engagement. Challenges include fruit selection, water management, and pollination, but organic solutions exist. Tools and resources are readily available, with suitable fruit varieties like guava, mango, and citrus thriving on rooftops. Starting your own rooftop garden involves choosing containers, preparing a good potting mix, planting, watering, fertilizing, and managing pests organically.

Introduction

In India, urbanization's rapid pace threatens vital agricultural land, demanding innovative solutions for food security and climate resilience. Rooftop farming emerges as a promising solution. In the 20th century, urban environments saw a surge in the popularity of rooftop or urban rooftop farming. This practice thrives in cities, where land for traditional gardens is scarce. With ample space on balconies and rooftops, along with abundant sunlight and water, large concrete buildings in urban settings offer ideal conditions for growing diverse fruit varieties throughout the year. Rooftop cultivation of fruit crops contributes significantly to urban planning by effectively absorbing solar radiation, thereby mitigating the "urban heat island effect." Additionally, they insulate and cool the buildings they inhabit, resulting in reduced electricity consumption and improved rainwater and stormwater management. In high-rise buildings where roof access isn't universal, containers can be placed on balconies and windowsills, offering alternative green spaces. Rooftop gardens foster a sense of community and environmental stewardship, encouraging urban dwellers to connect with nature and understand sustainable fruit production practices, from planting techniques to organic pest control. Additionally, rooftop fruit farming can be a source of income for individuals and communities, providing fresh produce for local markets or personal consumption, contributing to economic growth in urban spaces.

Challenges and considerations

- **Fruit Selection:** Choosing suitable fruit varieties adapted to rooftop conditions, including limited root space, sunlight availability, and wind exposure, is crucial for successful cultivation.
- **Water Management:** Efficient irrigation systems and rainwater harvesting techniques are essential to ensure optimal water use for fruit trees, especially in India's diverse climates.
- **Pollination Methods:** Ensuring proper pollination methods, such as hand pollination or attracting pollinators, is vital for fruit production. Understanding local pollinator populations and incorporating flowering plants can be beneficial.
- **Sustainable Pest Control:** Implementing organic pest and disease control methods is important for healthy fruit production in an urban environment, protecting both the fruit and the city's ecosystem.

Tools required

1. Hand hoe
2. Rose can
3. Spade/shovel
4. Gardening hose with sprinkler
5. Hand sprayer
6. Bamboo stakes with jute strings (for climbers and vines)
7. Secateurs

Inputs required

1. Good quality seeds from reliable sources

2. Soil free from stones, gravel, weeds and indecomposable materials
3. Organic manure (FYM/Leaf compost/ Neem cake/ Pongamia cake)
4. Organic inputs (Neem oil/ Panchagavya)
5. Chemical inputs (Fertilizers, pesticides, etc.)
6. Suitable pots and containers

S. No.	FRUIT	VARIETIES
1	Guava	(a) Lalit (b) Lalima (c) Shweta (d) Allahabad Safeda
2	Mango	(a) Amrapali (b) Arunika (c) Ambika
3	Citrus	(a) Sriganganagar Lime-1 (b) Nagpur Mandarin (c) Pant lemon (d) Kinnow mandarin (e) Sweet orange (Musambi, Jaffa, Washington)
4	Pomegranate	(a) Mridula (b) Bhagwa (c) Super Bhagwa
5	Strawberry	(a) Chandler

Fruit varieties suitable for rooftop cultivation

Steps involved to start rooftop farming

Selection of pots/containers

The most commonly available pots are- earthen pots, plastic pots, cement pots, grow bags, steel containers, Tin boxes, fertilizer bags, etc. Earthen pots are most suitable for all climates. The containers should be washed, and drainage holes must be made.

Preparation of potting mixture

Garden soil: Compost: Sand- 1:1:1 mixture or Garden soil: Compost: Cocopeat- 1:1:1 mixture. Using heavy soil is not advised for rooftop farming; Cocopeat can be used as it is lightweight and provides good aeration and drainage. Holes should be made in the pots/containers for drainage, and this should be covered with pebbles and gravels before filling it with the potting mixture. The pot should not be fully filled and a gap of 1-2 inch should be maintained on the top to avoid washing away the soil while watering.

Planting

The seedlings should be planted according to the season. The pot should be irrigated immediately after planting.

Irrigation

The thumb rule for irrigation is to rake the topsoil and see if the subsoil is moist; if so, there is no need for irrigation immediately. Irrigation can be done by rose can/ gardening hose with sprayer. Irrigating the plants in the evening is recommended as evaporation of the water due to direct sunlight can be avoided.

Fertilizer application

Organic manure such as FYM/Leaf compost/Neem cake can be used along with inorganic fertilizers. Top dressing of nitrogenous fertilizers such as urea or DAP improves the growth and yield of the crop.

Care and management

Use organic pesticides for the management of pests. Insect traps such as pheromone traps, light traps, etc. can be used to protect the plants from insects. Nets should be used for rooftop cultivation. Hand pollination must be done as there is a low chance of pollination by pollinators. Additionally, 3G technique can be adopted to increase the number of female flowers on the plant to get higher production.

Conclusion

Rooftop fruit farming is no longer just a niche practice; it holds immense potential to transform urban landscapes in India. From nourishing communities to mitigating climate change, its benefits are undeniable. However, realizing this potential requires a collective effort. Government support through policy frameworks and incentives, coupled with community engagement and knowledge sharing, can unlock this potential and pave the way for a greener, more resilient India, one rooftop garden at a time. Let's embrace this opportunity to cultivate not just fruits, but also hope for a sustainable future.