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Vegetable gardening in small space

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Abstract
Gardening vegetables is one of the May ancient time's time activities that people indulge in. Apart from being engaging these are cost-effective, as the garden shortly provides some exceptional home grown vegetables. The kitchen garden provide as a fundamental feature of an attractive, all season countryside, or it may be little more than a humble vegetable plot. It is a basis of herbs, vegetables and fruits. These small family plots have been called by a variety of names over the year- kitchen garden, portage garden, cottage garden, and horticulture garden. Though each of these grows vegetables, fruits, flowers, herbs and they are all modified to their environment and the customs of the people nurture them. With the raise in population and the rising trend of urbanizations direct towards a serious issue of food security and mal-nutrition. This paper deals with the soil preparation, growing media, containers used for gardening, different type of gardening, seedling and transplantation, care of vegetable gardening and benefits of vegetable kitchen gardening.

Keywords: gardening, urbanization, vegetable, kitchen

Introduction

Although gardening has been the part of a human civilization for more than 10,000 years, the initiative of kitchen gardening is something unique. These small family plots have been called by a variety of names over the year- kitchen garden, portage garden, cottage garden, and horticulture garden. Though each of these grows vegetables, fruits, flowers, herbs and they are all modified to their environment and the customs of the people nurture them. Incessantly rising food prices of basic kitchen items, fruits and vegetables the poor and fixed income groups are anguish from the decreasing real incomes and purchasing power. The slight increase in the income of the poor people to help them to gain access to food and improve their nutrition is the need of the present time. In cities and urban areas where there is shortage of land for farming and over-population, areas of land around the house that tend to be inadequate, dense by weeds and turned to decline dump could be an means of ensuring household food security and nutrition if properly control. With increasing civilization and western education, kitchen gardens are being integrated into modern houses for easy and quick access to fresh food produce and products (Sanogo, 2007) [16].

A kitchen garden has ample definitions. It is more common French term; these gardens are meant to provide the household with some vegetables, fruits or herbs. When hearing the term"kitchen garden" it is easy to envisage a shelf full of little flowerpots containing a few herbs. This can comprise vegetables, fruits, berries, herbs and flowers. Kitchen gardens can be grown-up in the unfilled space available at the backyard of the house or a group of women can come together, categorize a common place or land and grow desired vegetables, fruits, cereals etc that can benefit the women and community as a whole (Christensen, 2011) [1].

The various social benefits that have emerged from kitchen gardening practices are health and nutrition, enhanced income, self-employment, food security within the household and community social life (Rehman *et al*. 2013) [15]. Fruits and vegetable production gives households direct access to important nutrition that might not be within their budget to purchase (Talukder *et al*. 2001 [12]; Heim *et al*. 2009) [2]. Kitchen gardening has also authenticate cost-effective and sustainable method for producing organic vegetables such as cauliflower, radish and turnip (Titilola *et al*. 2012 [18]; Rani *et al*. 2013) [14, 15].

Kitchen gardening include to household food security by providing direct access to food that can be harvested, prepared and fed to family members, often on a daily basis. Even very poor, landless or near landless people put into practice of gardening on small plot of land of homestead land, vacant lots, roadsides or edges of a field, or in containers. Gardening may be done with virtually no economic resources, using locally available landing materials, green manures, "live" fencing and indigenous methods of pest control.

Objectives

1. To discuss the soil preparation, growing media, different type of home gardening, vegetable plant diseases, seedling and transplanting, fertilization and containers used for vegetable kitchen gardening.
2. To discuss the care and maintenance of vegetable kitchen gardening.
3. To discuss the environmental benefits of the gardening.

Research methodology

This paper is a descriptive study in nature. The secondary data and information have been analyzed for preparing the paper extensively. This paper proposes to take out a review of the research area of vegetable kitchen gardening in small spaces. The secondary information have been collected from different

scholars and researchers, published books, articles published in different journals, periodicals, conference paper, working paper, blogs and websites. All related articles are selected. In this paper we cover the soil preparation, growing media and containers used, care and maintenance, environmental benefits of kitchen gardening.

Soil preparation

To begin with a though spade digging is made to a depth of 30-40 cm. stones, bushes and perennial weeds are removed. A 100kg of well decayed farmyard manure or vermicomposte is useful and mixed with the soil. The soil must have the capacity to hold water and nutrients very well. It should be free from weeds and disease which are more flat to growth of plants. Apply clay soil, sandy loam soil which is microscopic in nature and has good retention of water and nutrients. Raised beds in kitchen garden of 120-150 square meter area, make them in a separate line as per the convenience and height should be 15 cm.

Growing media for vegetable gardening

By easy techniques to grow vegetable in reduced area. General thought – sunlight, soil, water, nutrients (fertilizer) and tools.

Sun: Vegetables need a good six or more hours of sun each day. Without sun, the fruits will not ripen, and the plants will be harassed. There are a few vegetables that can survive in light shade, such as lettuce and other greens, broccoli.

Water: Vegetables also require regular watering.

Soil: Vegetables require a soil rich in organic matter. Soil is essential to the growth of all plants but even more so with vegetables, because even taste is affected by the quality of the soil. A high-quality growing media must have adequate moisture retaining capacity, porous in nature, support good drainage. The soil mixture must be in ratio of 1:2:1 ratio of FYM, red soil, and sand. These are light in weight, ideal ph, absorb high water holding capacity. They are used in a ratio of 25% soil+ 75%compost.

Different type of home gardening

- Backyard gardening
- Balcony gardening
- Container gardening
- Indoor gardening
- Kitchen gardening
- Roof gardening
- Terrace gardening
- Organic gardening
- Vertical gardening
- Urban gardening

Container used for vegetable gardening

Different type of container can be used for growing vegetable crops. E.g. - pots, barrels, plastic jugs, plastic crates, plastic bottles and wooden boxes etc. Size of the container varies according to the crop. Pots of size 5-10 inch size are satisfactory for green onions and lettuce. Other vegetable like tomato, brinjal, and chili we have to use big sized pots. Adequate drainage is necessary for good container it should be filled with sand and small stones for easy drainage. The drainage holes are best located at the side of container. A good characteristic of a container is that it should hold soil tightly. Containers based on usage are –clay/ceramic pots, metal cans, and wood plastic.

Care Tips for Container Gardening with Vegetables

- Many plants grown in pots must be watered as often as twice a day.
- To keep plants sufficiently cool and moist during hot summer days, double-pot: Place a small pot inside a larger one and fill the space between them with wrinkled newspaper.
- Hanging baskets make good use of extra space, and herbs, cherry tomatoes, and strawberries grown at eye level can be easily tended and harvested.
- Add about 1 inch of coarse gravel in the bottom of containers to improve drainage.
- Vegetables that can be easily transplanted are best suited for containers.
- Feed container plants at least twice a month with liquid fertilizer

Seedling and transplanting in small space vegetable garden

For transplanting seedlings are either purchased directly from local nurseries or else grown at our own home. Fill the container with good media and wrap most of the vegetable seeds to a depth of 2-3cm to ensure good quality germination. The port trays are set aside under moisture and in a area where they get most favorable sunlight a period of 4-8 weeks preceding to the transplanting date into final container. The majority of the vegetable are transplanted in a suitable container when the seedling develops their first two to three leaves stage. Transplanting should be made carefully to evade damage to the root system. After planting quietly soak the soil with the water being careful that might agitate or washout or displace seeds. The vegetables like tomato, brinjal, chilli, onion, lettuce, cabbage, cauliflower etc. are suitable for raising in port trays and after a period of duration depend upon on the crop they are transplanted. Other vegetables like peas, beans, cucurbits like cucumber, melons are directly sown in suitable container.

Fertilization of vegetable gardening

When to fertilize

When plants grow grudgingly or start turning yellow, fertilizer may help. Too much fertilizer can burn plants. Tomatoes and beans given too much fertilizer grow lots of foliage but little fruit. Vegetables growing in porous, well-drained soil should be fed frequently. Generally a balanced fertilizer is applied every three to four weeks throughout the growing season. Vegetables growing in clay soils will need less fertilizer than those in sandy soils. One application every four to six weeks after planting is typically enough.

Animal Manures: Composted animal manures used in place of inorganic fertilizer are best applied as a side dressing.

Water: soluble fertilizers are often useful as a quick boost for vegetables. Liquids or crystals mixed with water are applied as frequently as once a week. Water soluble fertilizer containing iron, zinc, boron, manganese.

Dry Fertilizer: The fertilizer should be applied 2–3 inches to the side of, and 1–2 inches below, the seed level or plant row. Evade applying fertilizer when foliage is wet, and water after applying it to eliminate particles from foliage. For best results, use small amounts or light concentrations of fertilizer, and spread it over the root zone.

Table 1: Vegetable gardening calendar in India

Months	Vegetable grown
January	Brinjals, okra, cucumber, bottle guard, bitter guard, potato, radish, cabbage, capiscums
February	Beans, broccoli, cabbage, lettuce, onions, peas, bottle guard, pumpkin, bitter gourd, leaf beet, chilli, tomato
March	Broad beans, cabbage, celery.
April	Onion, amaranths, coriander, okra, tomatoes, chilli, gaurd
May	Radish, cucumber, okra, onion, chilli bottle guard, bitter guard, pumpkin
June	Brinjal, cucumber, all gourds, cauliflower, okra, onion, tomato, pepper
July	Okra, cauliflower, cucumber, cluster bean, bottle guard, chilli, tomato
August	Carrot, cauliflower, beans, chilli, leaf beet, turnip, beet
September	Cabbage, cauliflower, raddish, tomato, carrot, turnip, beet root, leuttce, leaf beet, potato, pea
October	Brinjal, cauliflower,leuttce,raddish,spinach,turnip,potato,garlic,pea, french bean, onion
November	Cabbage, carrot, beans, lettuce, okra, turnip, melon, beet
December	Lettuce, ash guard, bitter guard, bottle guard, cucumber, chilly, cabbage

Care of a Vegetable Garden

- **Water:** Endow with ample soil moisture throughout the growing season to help fast-growing plants establish strong roots and produce fruit. Maintain the top 6 inches of soil moist for seedlings and immature plants. Once plants become reputable, encourage deep rooting by wetting the soil at least 6 inches deep when the top 3 to 4 inches feel dry.
- **Mulch:** Add a 2-4 inch layer of organic mulch around vegetable plants to restrain weeds, preserve soil moisture, reduce watering, moderate soil temperature, improve soil health, and keep vegetables cleaner. Keep away from herbicide-treated lawn clippings, hay, and fresh sawdust and manure. Pertain mulch after the soil has warmed in spring and replace as needed.
- **Weed and thin seedlings:** Draw or hoe weeds as quickly as they appear and while they are small. By no means allow weeds to go to seed in your garden. Maintain mulch to suppress them. Eliminate crowded seedlings-especially carrots, radishes, onions, and beets-as soon as possible to give the remaining crop enough space to mature.
- **Fertilize:** Innate soil texture and fertility also play a role in when and how much additional fertilizer plants need. In common, fertilize transplanted vegetables (tomatoes, peppers, lettuce, and corn about 3 - 4 weeks after planting. Some crops may need additional fertilizer later in the season. Fertilize vine crops (melons, cucumbers) when the vines begin to spread and again when they bloom. Use 1 - 2 tablespoons of 5-10-10 per plant or 1 to 2 pounds per 25 feet of row. Spray fertilizer 6 to 8 inches from stems and scratch into the soil.
- **Harvest:** Choose vegetables when young and tender for the best flavor and to maintain the plants producing. If seeds begin to mature inside beans, peas, cucumbers, and summer squash, the plants will stop making new fruits. Harvest leaf crops (lettuce, spinach, and chard) by cutting to within 2 inches of the ground to encourage young, new leaves to grow.

Vegetable plant diseases

Anthracnose

- Tomatoes, cucumbers, melons and beans are most often affected by anthracnose. Symptoms include fruits and pods with small, sunken spots. Pinkish spores appear in the center of the spots in wet weather. For control, apply liquid copper or neem sprays before and during infection periods. Begin applications just as leaf buds break in the early spring.

Bacterial Leaf Spot

- Infected plants have small, dark water-soaked spots on leaves. These spots will dry up and drop out leaving “shot holes.” Small, sunken dark spots or cracks will also form on fruit. Bacterial leaf spot affects tomatoes, peppers and cabbage-family crops in the vegetable garden. There is no cure for plants infected with bacterial spot. Apply copper or sulfur-based fungicides weekly at first sign of disease to prevent its spread. Also, limit high-nitrogen fertilizers, rotate crops and destroy any heavily infected plants.

Club Root

- It infects brassica crops like cabbage, broccoli, cauliflower, etc. — which wilt during the heat of the day. Older leaves turn yellow and drop. Roots are distorted and swollen. For disease-resistant varieties and rotate crops. Fungicides will not treat this soil-dwelling micro-organism.

Downy Mildew

- It affects many vegetables and appears as a white to purple “downy” growth on the undersides of leaves and along stems.

  The best way to prevent downy mildew is to avoid the conditions that favor it. Water in the early morning to give plants time to dry out during the day. If infection shows early, apply copper fungicides every 7-10 days until harvest. Dispose of severely infected plants.

Early Blight

- Symptoms of early blight include brown and black spots on leaves that enlarge and develop rings like a target. Leaves may actually die. Find out the sunken spots on fruits and tubers. Prevention measures include proper seed selection and using a copper-based fungicide early, two weeks before disease normally appears.

Late Blight

- This fungal disease occurs later in the growing season with symptoms often appearing after blossom. Look for water-soaked spots on lower. Late blight affects tomato and potato plants in the vegetable garden. Plants will rot and die in wet weather. Select resistant cultivars when available and dispose of all infected plants and tubers. Apply copper sprays

every 7 days or less, following heavy rain or when the amount of disease is increasing rapidly.

Mosaic Virus

- It affects a variety of plants including beans, tomatoes and peppers. Mosaic virus causes mottled green and yellow foliage or veins. Leaves may curl or wrinkle and plant growth is often stunted. There are no cures for viral diseases such as mosaic. Take preventive measures such as planting resistant varieties and controlling insect pests, especially aphids and leaf hoppers that spread the disease. Remove and destroy infected plants

The Environmental Benefits of Gardening

- Plants Naturally Clean the Air and Ground
- Reduce Cooling Costs with Well Placed Trees and Shrubs
- Growing Your Own Food Reduces Carbon Footprints
- Prevents Soils Erosion
- Replenishes Nutrients in the Soil
- Helps to Reduce Noise Pollution
- Supports Beneficial Insects and Birds
- It keeps up stay healthy
- Cheap and affordable
- Harvest fresh and eat fresh
- No hazard
- Year round production
- More food per square foot

Conclusion

It is accomplished that kitchen gardening is a healthy and pleasurable activity. It is inimitable kind of activity. Commencing the kitchen gardening, people can get fresh and healthy food. The majority of the people like to eat organic food thus the kitchen gardening is one of the sole source of organic food. From kitchen gardening people can also manage their financial expenditures and they can acquire fresh and healthy vegetables and fruits from their own gardens. Therefore in such a manner kitchen gardening also provide financial support as well. For this there is need of basic training. Women currently plays a very significant role in endorse the activity of kitchen gardening. It is also an important and cheerful activity which makes people self-sufficient in the production of vegetables and fruits. By the kitchen gardening, we can get better and superior quality of food; it is also a learning activity, like through kitchen gardening people learn about the variety of seeds, fertilizers, pesticides etc. People can enhance their skills and knowledge through such a great activity. People also learn about the diseases, quality of food, importance of organic food and their effects on health.

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