

Vegetable kitchen garden:

A promising approach to enhance the household food security

Sarvpriya Singh* and Ajitpal Singh Dhaliwal

Krishi Vigyan Kendra, (Punjab Agricultural University), Bathinda, Punjab 151 001

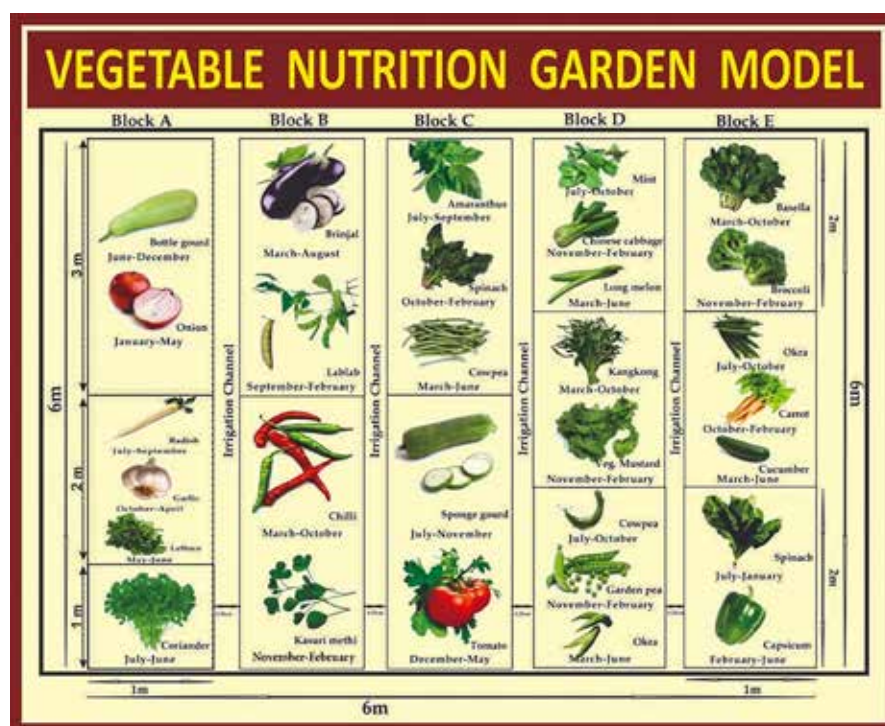
The concept of kitchen gardening was developed by various institutes for growing winter/summer vegetables. If these vegetables are grown in a planned manner, one can get fresh vegetables for whole the year. Every person should consume a balanced diet to stay healthy and this concept is a blessing for providing us balanced diet. The growing of vegetables by this technology provides us fresh and pesticides free vegetables. It can also save a huge amount of money which is spent on purchase of vegetables. In urban and peri-urban areas, people can not produce vegetables for themselves even if they wish to grow, due to the shortage/higher land prices. In this regards, rooftop/terrace Vegetable Nutrition Garden is the best alternative to grow vegetables. It ensures regular supply of fresh vegetables. In this concept, soilless media like coco peat used as a medium for growing vegetables on rooftop/terrace/front yard/ backyard depending upon the space available.

Keywords: Grow bags, Kitchen garden, Roof top garden, Seasonal vegetables

AVAILABILITY of vegetables is less than 200 g per capita per day in our country. To feed the present population of the state, there is a need to double the total production of vegetables. Besides this, the state has to produce additionally to meet the requirement of the processing industry, exports and seed industry. Therefore, there is an immense scope of increasing area in the state. The vegetables are grown mostly in the vicinity of cities for commercial purpose. The supply of vegetables in the cities is uneven and uncertain which results into fluctuations in their prices. However, in the villages, the availability of vegetables is more disappointing than in the cities. In present era, the organic farming prohibits the use of synthetic agro-chemicals and relies on crop rotations, crop residues, animal manures, composts, legumes, green manures and on-farm wastes to maintain the soil productivity and supply nutrients to the crops. Disease and insect-pest management is

done by using biopesticides. On the contrary, the inclusion of vegetables in the daily diet is indispensable for the maintenance of good health. For the supply of fresh vegetables, the

available area near and around the houses or near the tube wells at the farms can be utilized for growing vegetables.



Vegetable kitchen garden model for summer/winter vegetables

Vegetable kitchen garden model

Dietary diversification balances the diet by enhancing the supply of essential micronutrients leading to improved health, enhanced thinking ability and increased efficiency. In addition, micro-nutrient deficiencies affect the lives and health of a large number of people and three nutritional problems having serious consequences include deficiencies of iron, vitamin A and iodine. Vegetables also help to combat malnutrition and diversify diets. Most of the vegetables reaching the market contain high amount of pesticide residues, it is of special interest of the consumers to grow vegetables themselves for their own use with minimum or no use of pesticides. The improved model has been developed by Punjab Agricultural University, Ludhiana, Punjab which involves many annual crops that can be repeatedly harvested to meet a family's vegetable needs throughout the year (Table 1). The crops and their varieties are scientifically selected to be highly nutritious with few pest and disease problems. The suggested model can produce 300 kg of vegetables each year from 6 m × 6 m land by growing 27 different vegetables. This will be sufficient to meet vitamins, minerals and protein requirement of a family comprising two adults and two children.

Points to be remember

The cucurbitaceous vegetables like bottle gourd, sponge gourd, long melon, cucumber; and tomato are weak-stemmed and should be staked vertically with the help of nylon ropes tied to bamboo at a height of 8 feet for production of good quality fruits. Staggered sowing of coriander, carrot, radish, methi and okra at fortnightly intervals is recommended for continuous supply of these vegetables.

Rooftop/terrace garden for growing vegetables

Vegetables are enriching with vitamins, minerals, fibers and phytochemicals/ antioxidants that build immunity against

Table 1. Time of sowing and spacing of vegetables

Vegetable	Sowing time	Spacing (cm)	
		Rows	Plants
Carrot	August-September	45	7.5
Radish	Mid-September to October	45	7.5
Turnip	August-September	45	7.5
Coriander	October-November	30	In rows
Spinach	September-October	20	In rows
Metha	October-November	22.5	In rows
Methi	September-October	20	In rows
Peas	Mid October-mid November	30	10
Broccoli	September-October	45	45
Chinese cabbage	September-October	45	30
Okra (Bhindi)	February-March and June-July	45	15
Bottle gourd (Ghia Kadoo)	February-March and June-July	250	60
Bitter gourd (Karela)	February-March and June-July	150	45
Summer squash (Chappan Kadoo)	February-March	125	45
Cucumber (Kheera)	February-March	250	60
Long melon (Tar)	February-March	250	60
Cowpea	February-March and June-July	45	15
Pumpkin (Halva Kadoo)	February-March	300	60
Sponge gourd	February-March and June-July	300	75
Round gourd (Tinda)	February-March and June-July	150	45

diseases. Due to the shortage/ higher land prices, people can not grow vegetables in urban and semi-urban areas. Rooftop/terrace vegetable nutrition garden is the best alternative to grow vegetables depending upon the space available. This garden ensures regular and fresh vegetables.

Grow bags technique

The utilization of coco peat bricks retains moisture, stores and releases nutrients to roots over extended period of time and enhance plant growth. It is ideal growing media for horticultural plants and other agricultural applications. The dry coco peat slab is around 1.5–2 kg



Awareness regarding vegetable kitchen garden at KVK Bathinda



Rooftop/terrace garden for seasonal vegetables

in weight. The slab type grow bags are also environmental friendly. The EC of slab is <0.5 and pH is around 6–7 and the expected life is around 3 growing seasons or years.

Design of five row model

Rooftop vegetable nutrition garden model is designed to withstand the load of covering material, rainfall and specific cropping activity. The site for the

Table 2. Dimension and material used for rooftop kitchen garden

Structure dimension	Size
Height of the structure	2.2 m
Front width of the structure	4.2 m
Length of each bench	3 m
Width of each bench	0.4 m
Spacing of benches	0.5 m
Slope of benches	1–1.5%
Net area	12.6 m ²

rooftop vegetable nutrition garden should be fairly shadow free. The developed model is user friendly, easy to operate and maintain. The detailed dimension and material used for this model are as given in Table 2.

Salient Features of the Rooftop vegetable nutrition garden model

- This model has been designed for urban and semi-urban areas where space is one of the major constraints.
- Five row model requires 12.6 m² (4.2 m × 3.0 m) net area and 20 m² (5.5 m × 3.6 m) gross area, whereas the three row requires an area of 6.90 m² (Net area= 2.3 m × 3.0 m) and a gross area of 12.96 m² (3.6 m × 3.6 m).
- A timer has been integrated into the system to automate the daily nutrients solution supply which

would be useful for those that lead busy lives and are away from home during daytime. Leachate from the garden can be recycled into the system after filtration.

- It can also be used for raising ornamental/medicinal plants.
- The vegetables produced are safe to eat and will be sufficient for a family of 2–4 persons.
- With staggered sowing/transplanting or staggered cutting in case of multi-cut leafy vegetables, the vegetables would be available throughout the season.
- The vegetable nutrition garden has a provision of fixing shade over the UV stabilized sheet.

Economic benefits

In nuclear families, the approximate cost of vegetables consumption is about ₹3000/month but in large families it will be approx. ₹4000–6000/month. Annually, the expenditure of consumptions of vegetables is about ₹36000 but in large families it is about ₹48,000–60,000. So, the vegetable kitchen garden helps to save money and also provide nutritive and diversified diet to our families.

Way forward

The following points are kept in mind while kitchen gardening in future:

Success story

Satnam Singh belongs to village Burj Thror, Bathinda, Punjab promotes the vegetable kitchen gardening at household level. He got training as a 'Nursery Worker' from Krishi Vigyan Kendra, Bathinda and then he established his own vegetable kitchen garden. He learnt how to prepare seeding mixture using biofertilizers and biopesticides from the training and started growing the vegetable seedlings of onion, tomato, brinjal, cauliflower, cucurbits, capsicum and chilli. In addition to providing high quality seedlings, he also gives valuable suggestion to the farmers about cultivation practices.

Along with the successful nursery production, he is also running a small dairy unit. He is a knowledge seeker farmer and often comes in Krishi Vigyan Kendra, Bathinda, and also participate in camps and seminars organized by this Kendra. He regularly stays in touch with the scientists of KVK Bathinda for technical advice. He also saves approximately ₹3000/months which was earlier spent on purchase of vegetables.



Visit of nursery trainees at Satnam Singh's vegetable kitchen garden

- These types of nutrition garden technologies provide seasonal fresh and chemical free vegetables to us and nutritive security to our nation.
- Urban-peri urban and landless farmers are not aware such type of vegetable nutrition gardens which can secure their families from different diseases. So large number of awareness campaign was created by ICAR, state universities, cooperative institution and other organizations by distribution of free of cost vegetable seed kits among the farmers and farm women's.
- Thus, extension functionaries

like state horticulture department, krishi vigyan kendra's could create awareness to adopt vegetable kitchen garden, terrace garden, vertical garden etc at backyard and utilization of other vacant space at our home.

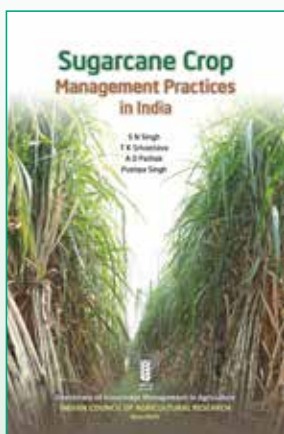
SUMMARY

Vegetable kitchen garden and rooftop garden provide us seasonal vegetables which meet the daily requirement of the family. During covid-19 pandemic, the Urban and peri-urban areas adopted this type of technologies which provided them fresh and chemical free vegetables. In present era, peoples are more

aware for their health and prefer to grow organic vegetables at their home. This technology also provides physical exercise to the peoples. The profound adaptation of the farming system and the landscape determines the course of farm development for the long-term. It is suggested that the vegetable kitchen garden and roof top kitchen garden is the best option to grow vegetables depending upon space/backyard/terrace of house for getting fresh seasonal vegetables and get rid of diseases from our nation.

*Corresponding author's e-mail: sarvpriya90@pau.edu

Sugarcane Crop Management Practices in India



A single publication collating sugar-cultivation practices in different states of India is still unavailable. The present textbook is penned by the eminent scientists of ICAR-Indian Institute of Sugarcane Research, an umbrella institute under ICAR, dedicated to research on fundamental and applied aspects of sugarcane. The Book attempts to address sugarcane cultivation practices in Indian states. The book comprehensively presents the recent cultivation practices of 17 states with detailed description on climatic conditions, soil, sugarcane-based cropping systems, preparatory tillage/field preparation, planting methods and geometry, fertilizer and manures, their time and method of application, irrigation/water management, intercultural operations, weed management, plant-protection strategies, harvesting, jaggery making, ratoon management, cultivation economics and constraints in sugarcane cultivation in a simple and lucid way. Each chapter caters to a

single state. Since the information pertaining to sugarcane management practices being followed in different states of the country is not available at one place, this textbook will be a knowledge resource for the vast network of sugarcane research, training, extension and development activities. This book will serve the purpose of different stakeholders and interested readers and go a long way in nurturing the interest of sugarcane farmers across the states for sustained sugarcane productivity.

TECHNICAL SPECIFICATIONS

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Directorate of Knowledge Management in Agriculture
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012
Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@gmail.com