

## Cultivation in gunny sack

Sack cultivation is the practice of growing vegetables, exclusively in gunny sacks instead of planting them in the ground<sup>1</sup>. Gunny sacks have been perpetually used as traditional storage material for packaging of farm produce and grains such as maize, rice, millet, sugar and farm inputs (e.g. chemical fertilizer). This sustainable livelihood practice of farming in sack involves filling the bag with soil, manure and growing plants on the top soil and inside holes. Thus, the key aspect of this farming is that it ensures food security, good health by curbing air pollution, green ecology, income generation and reduces vehicular pollution and traffic of food cargo. Suspending olericulture in above ground sacks leads to higher vegetable productivity where constraints like unfertile or problem soil, waterlogging is regularly encountered.

Sack cultivation can develop local food production system by creating gardens with nutrient-rich vegetables, thus helping extremely deprived households in attaining food security while also diversifying their diet<sup>2</sup>. Growing superfoods like spinach and other root crops not only cuts grocery bills, but also infuses otherwise poor diets with essential nutrients. Thus, this new sack farming allows diversifying diets and addressing micronutrient deficiencies.

Sack farming provides the opportunity to address the twin objectives: (i) Diversifying the diet of targeted households through self-production of vegetables. (ii) The possibility for households to make savings from the reduced purchase of vegetables induced by self-production. Besides, they become self-sufficient, reducing household food purchasing costs and increase income through sale of surplus produce. Thus it is ideal for income intensification in small plots of land.

Sack farming is ideal to meet land scarcity in a sustainable way. Other benefits include: it requires less water as jute sacks can hold sufficient water, water logging can easily be avoided/drained, i.e. increased protection from flooding,

require simple and inexpensive materials (sack, stones, soil and manure), decreased water evaporation during periods of drought, weed control is much easier, plants can be transferred from one place to another as per requirement of shadow or sunlight, increases crop diversification and cropping intensity, disposal of the gunny sack is easy as it is biodegradable and environment friendly.

The nurseries play a key role in sack-gardening projects, as the seedlings produced in the nursery are further utilized in sack bags.

For sack preparation, the following steps are followed: (i) At first, the bag is cleaned and soaked in systemic insecticide and fungicide solutions to increase its longevity. (ii) A tube is placed vertically in the middle and filled with stones which will give structure to the bag and also help in drainage<sup>3</sup>. (iii) Around the stone column, soil mixed with manure and compost is packed properly. (iv) Holes are made on the sides of the bag at 15 cm apart from each other. Water is sprinkled thoroughly on top as well as on the sides of the bag. (v) The seedlings produced in the nursery are then carefully placed in the holes of the bag at the sides, without damaging the roots. At the top, seeds can be sown followed by sprinkling of water. The bag is watered daily. In addition to organic fertilizers, chemical fertilizers such as urea, triple super phosphate and muriate of potash can be used for better growth of the vegetables. Application doses depend on the type of vegetable and its nutrient requirements, but a standard amount of 15 g of urea, 20 g of TSP and 15 g of MOP may be applied. If needed, organic insecticides are used. The dead plants and weeds are discarded from time to time. Within a few weeks, the bag will be ready for harvest depending on the type of vegetable grown.

Root vegetables (carrots, beets, etc.) and bulbs (onions) are generally considered as they have small vegetative growth while leafy vegetables usually allow for several harvests at different

times on one single plant. Fruits are not recommended because they may destabilize the bag. Hence the common choices include tomatoes, onions, spinach, amaranth, ginger, etc.

Vegetables like tomato, spinach, okra, chilli, brinjal, knolkhol, radish, bottle gourd, ash gourd, ridge gourd, bitter melon, cucumber, snake gourd and beet can be planted on the top of the sack. It is better to promote the culture of short rooted plants at the sides of the bag that can stand upright unsupported, i.e. leafy vegetables and herbs. Moreover, seedlings of beet, chilli, okra and sweet potato can be planted on the sides of the sack.

The only limitation with sack cultivation is that except the flat top of the sack, plants are incapable of growing from seeds at the side of the gunny sacks. This happens because a plant growing from a seed may not grow through the predetermined holes and rather remain stuck inside the bag where, it cannot grow in absence of the sunlight. Under this condition, proper plant growth can be ensured by transplanting seedlings into the side holes so that they do not face inhibition and are exposed to the outside environment.

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3. Gallaher, C. M., Mwaniki, D., Njenga, M., Karanja, N. K. and WinklerPrins, A. M., *EcoHealth*, 2013, 10(1), 9–20.

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