

Importance of Nursery in Cucurbits for Higher Returns

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Introduction

Cucurbits are one of the most important vegetable crops cultivated in pan-tropical regions. They provide a good amount of water for consumption during the summer season. Cucurbits are a good source of nutrients, such as fiber, vitamins, and polysaccharides, Vit. A, Vit. C, but also show medical value, such as hepatoprotective and anti-inflammatory activities.



Some cucurbits in the early stage are highly susceptible to biotic stress like insect-pest (like red pumpkin beetle - *Aulacophora foveicollis* etc.), disease (damping off, rotting, etc.) use of nursery can be done but because the seedlings of cucurbits cannot be raised through traditional system as they do not tolerate against slight damage to the root system during uprooting and transplanting. The plug-tray nursery raising technology by using soil-less media is efficient for raising the seedlings of major cucurbits viz., cucumber, muskmelon, watermelon, bottle gourd, bitter gourd, pumpkin and summer squash, ridge gourd and sponge gourd, etc. Root development under this system of nursery raising is always vigorous. The quality of transplant affects plant establishment, initial growth, and consequently yield, the production method of vegetable seedlings is extremely important. The term “good quality” is generally defined as those with no infection of disease or pest, the ability to survive in unfavourable environments after transplanting, a well-developed root system, and a well-developed leaf area without visual defects of leaves such as chlorosis or necrosis.

Cucurbit nurseries serve as crucial hubs for the cultivation of high-quality cucurbit vegetables. By providing healthy, disease-free seedlings, nurseries contribute significantly to increased

yields, improved fruit quality, and reduced risk of crop failure. The controlled environment offered by nurseries ensures optimal seedling development, fostering uniformity and promoting earlier planting, ultimately leading to higher productivity.

Nursery

Nursery is a plot where young seedlings are nurtured, cultured, and provided, with proper conditions for their germination and they are cared till the time they are ready for transplanting. Nurseries provide controlled environmental conditions to cultivate strong healthy seedlings/saplings to ensure a higher chance of survival and thriving when transplanted to the field. A nursery is a managed site, designed to produce seedlings grown under favourable conditions until they are ready for planting.

Importance in cucurbits:

- **Wider adaptability:** Some cucurbits are sensitive for germination towards the abiotic stress. The sudden change in weather from winter to spring, in this germination percentage of the seeds reduces, for this nursery plays a very important role in providing a proper temperature to the seed, and after germination, the nursery also saves it from uneven rain. The seedlings can be then transferred to the main field in good environmental conditions.
- **Uniformity:** Nursery-raised seedlings are typically more uniform in size and development, leading to better crop yields. Nurseries can precisely control the nutrient content of the growing medium, ensuring that all seedlings receive the necessary nutrients for optimal development.
- **Quality Planting material production:** In the nursery, the seedlings produced are free from the attack of soil-borne pathogens (due to soil-less media), and the attack of insect pest. The growth of the plant is also vigorous as the right amount of nutrients is applied as per the crop requirement.
- **Scope of Grafting:** Nursery offers a wide variety of plant options and ease in performing grafting-like activities. The grafted plant requires an optimum temperature, RH, and microbe-free environment for its proper growth and development.
- **Cost reduction in plant protection:** The seedlings at the young and tender stage are more prone to insect pests, and diseases. The management of these insects, pests, and

diseases in the main field requires more resources (like chemicals, labour, and organic materials like NKSE, etc.) on the other hand for easy and economic management of insects, pests, and diseases in the nursery should be opted as it requires a less area to be managed.

The importance of selection of nursery over direct sowing is:

1. Easy observation of all the plants.
 2. Early detection of disease.
 3. Avoid virus attacks using an insect-proof net.
 4. Less area to be treated so reduced cost.
- ✚ **Cost reduction in nutrient application:** The area under the nursery is much less than the area in the main field so the application of nutrition (nitrogen) can be done easily and economically.
- ✚ **Cost reduction in crop management:** For the management of seedlings at the initial stage of the growth requires more attention as they are tender. The observation, frequent irrigation, hoeing, weed management, etc increase the cost if it is done in the main field whereas in the nursery small area is to be managed that requires reduced cost input.

Other Benefits:

1. Less number of seeds are required in case of transplanting compared to direct sowing.
2. No requirement for gap filling.
3. Reduces labour costs.
4. After transplanting, the leftover plants can also be sold in the market for additional.

Profit:

Profit should normally be at least 15-20%. If the nursery is small, the profit margin per plant should be larger. If the nursery is large, the profit per plant can be kept lower. In that situation, profit comes through the quantity of sales.

Costs of vegetables are administered by the law of free market activity. At the point when the supply of any vegetable surpasses the interest for that item, costs will in general be lower than normal. Similarly, when the demand exceeds the supply, prices tend to rise. Often small changes in quantities offered for disposal on the National Markets have a magnified effect on prices.

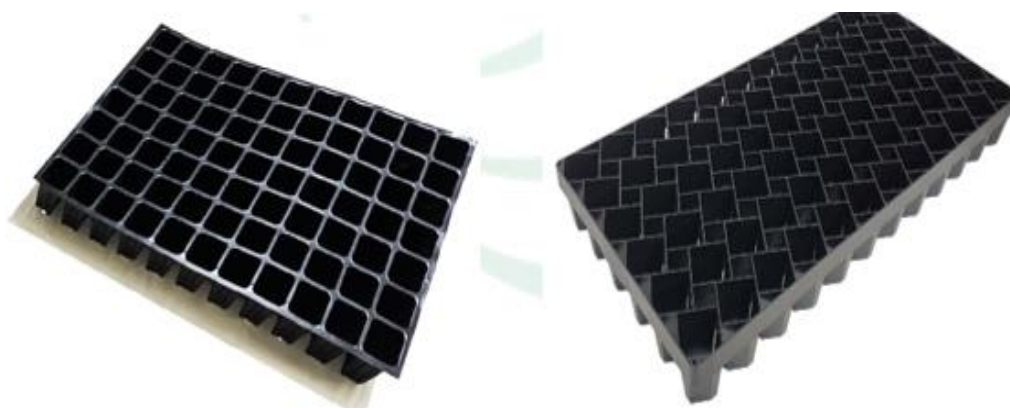
Growing Containers:

- **Plugtrays:** Plug trays are specialized containers used for starting seeds or seedlings. They have multiple small compartments, or "plugs," that hold individual plants. This design promotes even growth, prevents root tangling, and makes handling and transplanting easier. Plug trays are often used in greenhouses, nurseries, and home gardens.
- **Grow-bags:** A grow-bag is a planter filled with a growing medium and used for growing plants, usually tomatoes or other salad crops. Originally made of plastic, modern bags are also made from jute or fabric. The growing medium is usually based on a soilless organic material such as peat, coir, composted green waste, composted bark, composted wood chips, or a mixture of these. Various nutrients are added, sufficient for one season of growing, so further only planting and watering are required by the end user.



Size and shape variations:

The adaptability of grow bags for trees spreads beyond fabric configuration to contain a broad array of sizes and shapes, each crafted to cater to the requirements of various plant kinds and spatial arrangements.



- **Small Grow Bags:** Small grow bags, usually varying from 1 to 3 gallons in size, are perfect for nurturing herbs, small flowers, and leafy greens. These bags are ideal for gardeners with limited areas, such as balconies or small courtyards.

- ✚ **Medium Grow Bags:** Medium-sized grow bags, usually available between 5 to 10 gallons, are perfect for a broader range of plants, containing larger vegetables like tomatoes, peppers, and cucumbers, as well as small shrubs.
- ✚ **Large Grow Bags:** For gardeners considering nurturing root vegetables, such as carrots, potatoes, and beets, or for those interested in cultivating larger plants or various plants together, large grow bags are the way to go. These bags can vary from 15 gallons up to 100 gallons or more.
- ✚ **Specialized Shapes:** In addition to size differences, grow bags are available in shapes to accommodate distinct growing needs. For example, vertical grow bags with various pockets are crafted for growing strawberries or herbs in small spaces, using vertical space competently. Similarly, rectangular, or square grow bags propose a choice of conventional round shapes, delivering a better fit for certain garden layouts or for use in raised beds.

Soil-less media used in cucurbit nursery production:

- ✚ **Peat Moss:** *Sphagnum* peat moss is currently the most common organic component of growing media in temperate zone nurseries. Although types of peat moss may appear similar, they can have very different physical and chemical properties. The horticultural properties of *Sphagnum* peat moss and the fact that it has uniform quality make it the only peat moss choice for plant nurseries that use peat moss.
- ✚ **Compost:** Because of the risks of using soils and the expense of importing peat moss, many tropical nurseries prefer organic compost as a green alternative to peat moss. Composting is the physical and chemical decomposition of organic materials caused by the digestive activities of insects, fungi, and bacteria. Raw materials for compost include any plant wastes such as vegetable or fruit scraps, leaves, weeds, or by-products, such as cacao pods, coffee pulp, orchard pruning, and rice hulls; aquatic wastes such as aquatic weeds or fish parts from fish processing; animal wastes such as manures, feathers, and bedding.
- ✚ **Coconut Coir:** A by-product of processing coconut husks is known as coir dust, coco peat, or simply coir. This material has proven to be an excellent organic component for container-growing media. Coconut coir has many desirable qualities: high water-holding capacity; excellent drainage; absence of weeds and pathogens; physical

resiliency; slow decomposition; easy wettability; and acceptable levels of pH, cation-exchange capacity, and electrical conductivity.

- ✚ **Vermiculite:** Vermiculite is a common component and is a hydrated aluminium-iron-magnesium silicate material that has an accordion-like structure. Vermiculite has a very low bulk density and an extremely high water-holding capacity, approximately five times its weight.
- ✚ **Sawdust:** Raw sawdust, with its high C: N, can negatively affect nutrient availability, especially nitrogen but its properties can be improved with composting. Also, because of inherent differences in chemical properties between different woods, the suitability of sawdust as an organic growing media component is extremely variable. Some species produce sawdust with phytotoxic effects. Only consider using sawdust from sawmills because other wood residues, such as from treated boards, may contain preservatives or harmful chemicals.
- ✚ **Perlite:** Perlite is a siliceous material of volcanic origin. Perlite particles have a unique closed-cell structure so that water adheres only to their surface; they do not absorb water as peat moss or vermiculite do. Therefore, growing media containing perlite are well-drained and lightweight. Perlite is also rigid and does not compress easily, which promotes good porosity.
- ✚ **Pumice and Cinder (Scoria):** Pumice is a type of volcanic rock consisting of mostly silicon dioxide and aluminium oxide with small amounts of iron, calcium, magnesium, and sodium. The pumice particles' porous nature improves aeration porosity and retains water within the pores.
- ✚ **Sand:** Sand is one of the most readily available materials and is relatively inexpensive. The composition of sand varies widely. The type of sand and sand particle sizes must be considered when considering if local sand is a suitable component.