

## Nursery raising for livelihood security

The growing commercialization and consumeristic tendency of society in globalized economy has made impact on traditional areas of nursery and plant propagation. The profitability of technology needs to be demonstrated. In nursery enterprises, high input cost is easily overcome by bulk production and high productivity with low mortality. The economic evaluation of plastic house for the year round grafting shows that a net return of ₹39,295 from 75 m<sup>2</sup> low-cost polyhouse is obtained within 6 months. Nursery raising not only includes the production and supply of grafts and seedlings but also the strategic marketing efforts in order to reach maximum number of clients. It is of significance especially in perennial horticultural crops which has a long gestation period and effects are known only in later stages. The timely availability of plantlets also circumvents problems arising out of erratic weather condition as witnessed in recent times. The loss during plant multiplication in nursery can be minimized by having hi-tech nursery facilities and resolving the common errors. Thus, nursery sector in coming time will definitely play an important role in employment generation and is a remunerative enterprise in the changing national scenario.

**N**URSERY is starting point for successful planting. In a general nursery, one can carry out following activities namely raising of plant's seedlings, raising rootstocks, propagation of improved varieties of crops, vegetative propagation, conservation of delicate seedlings, multiplication of rare types of plants and income generation etc. Hi-tech facilities in nursery are useful in increasing the success rate of graft and rooting of cuttings, increasing seedling vigour, reducing transplanting shock and generally reducing the quantum of manual work. The nursery management gained a status of commercial venture where retailer nurseries sell planting materials to the general public nurseries, which supply the needs of institutions of private estates. Entrepreneurship is the capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit.

In economics, entrepreneurship combined with land, labour, natural resources and capital can produce profit.

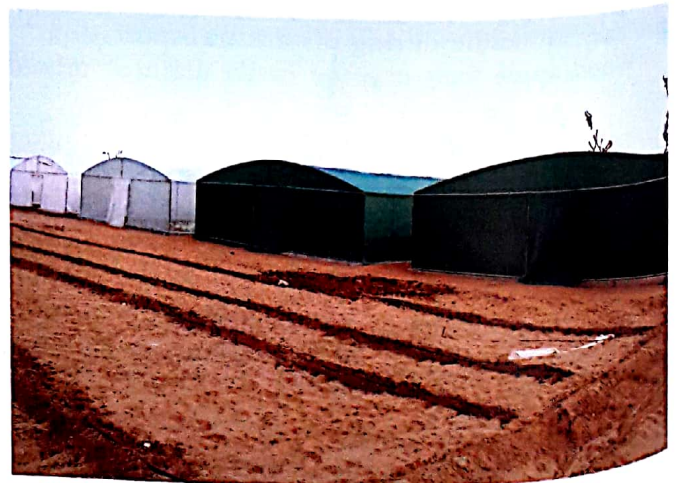
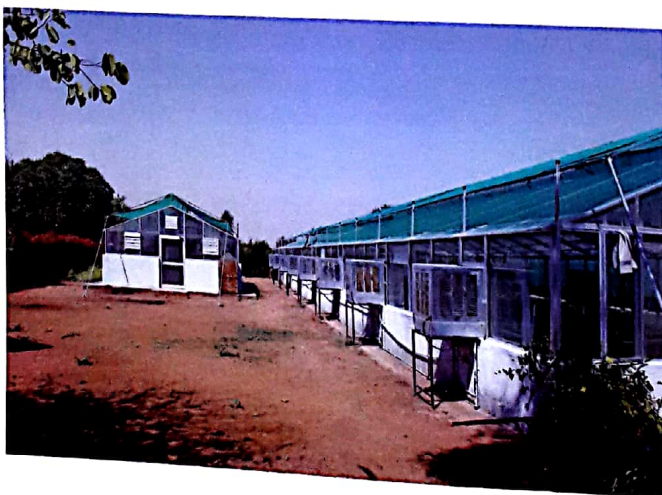
Therefore to start a new business as a nursery entrepreneur one should know nursery types, its components and profit management in this enterprise.

### TYPES OF NURSERIES

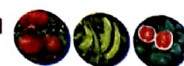
#### Production Nurseries (Wholesale Nurseries)

Propagate plants and grow seedlings, and either sell them direct to retail outlets, landscapers and horticulture or forest departments, or wholesale them to growing-on nurseries. Important features of successful production nurseries are:

- Innovation - Supplies new varieties to the market or developing new ways of growing and allow the grower to develop new markets for existing varieties.



Nursery unit at ICAR-CIAH, Bikaner





- Specialization - Growing fewer lines in larger quantities allows the grower to improve efficiency.
- Meeting market demands- Knowing market demand and customer's choice or are likely to want and growing them in sufficient quantities allows the grower to meet consumer's requirements and maintain customer loyalty.

### Growing-on Nurseries

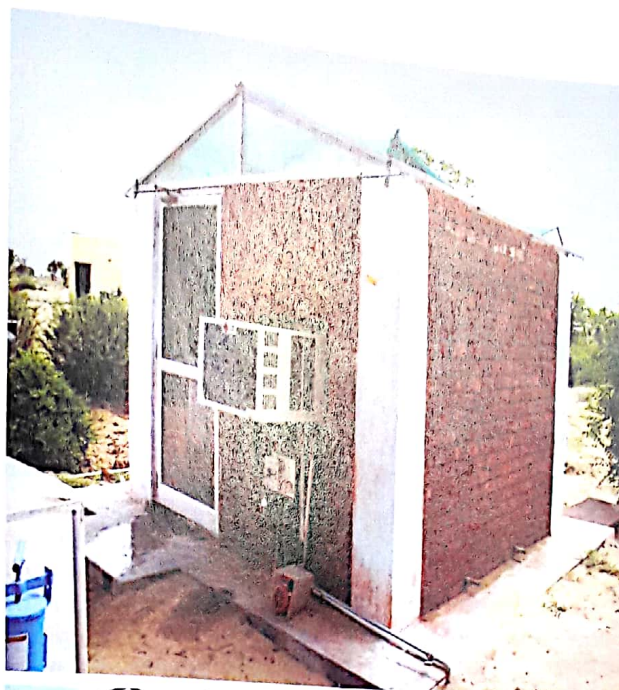
Growing-on nurseries buy bulk quantities of seedlings or small plants from propagators. At the time of purchase, the plants are grown in plugs, trays or tubes and then the plants are potted into larger containers and grown for a period of time, adding value to the nursery's purchase. In addition to increasing plant size, specialized growing techniques, such as topiary, may be used to add value to the plant during the growing-on phase. The most critical aspect of production in growing-on nurseries is developing a quality product for the retail market. At the time of resale, every plant must be at its peak, displaying healthy, vigorous and sturdy growth.

### Mail Order Nursery

It is a specialized type of wholesale nursery. It depends primarily on the catalogue display of the plants, which it offers for sale. Customers see the plants, which it offers for sale. Customers see the catalogue and order or receive the plants through mail or parcel service. This nursery is located in the locality, where land is comparatively cheaper and labour, water and transport facilities are easily available.

### Retail Nurseries

Retail nurseries buy plants from production/propagation nurseries and resell them in small quantities as per consumer's need. In addition, the retailer also sells seedlings, bulbs, containerized and bare-rooted plants, pots, packaged potting mixes, fertilizers, sprays and bulk landscaping materials.



Mist chamber and hardening unit in nursery

### Small-size Nurseries (Home Nursery/ Company Nursery)

It is small in size (500 sq. meter area) in which the plant materials are grown to meet the demand for own use and closely related persons. This type of nursery is only for personal use for beautification of own home, specific colony and company garden. The main objective of such nursery is to provide the quality materials. Usually costly method of nursery practices is followed in this type of nursery for raising high quality planting materials. Annual plant production of small nursery is less than 5,000 plants; here the economy does not play a major role.

### Medium-sized Nurseries

It is medium in size (500-2500 sq. meter area) in which the plant materials are produced to meet out the demand of local specified area for particular crops. Medium size nurseries should be located in the specific crop

Table 1. Variable cost for 30,000 sapling preparation of khejri

Particular	Required quantity	Rate (₹)/unit	Cost (₹)
Cost of polybag	55 thousand	1.0	55,000
Seed	15	800	12,000
FYM/ Compost	10 trolley	1500	15,000
Soil/ pond silt	20 trolley	600	12,000
Growth regulators	5 g	600/g	3,000
Trench preparation/ bag filling/arrangement	55000 bags	1 bag	5,000
labour			
Insecticide-fungicide and other agrochemicals	12 months	-	15,000
Watering, seedling maintenance cost	12 months	5000/month	60,000
Budding/grafting labour on successful budding	30,000	8	2,40,000
Sprout removal/shifting/ hardening labour	30,000	1	30,000
Miscellaneous	-	-	5,000
Total			4,52,000



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producing area like papaya production, mango production and citrus production area. Utilization of available farm machinery, human power and other resources are main objectives for producing quality planting material. Average annual plantlet production of medium nursery is 5,000 to 50,000. It is a supplementary business of farmers.



Khejri rootstocks

### Large Nursery (Commercial Nursery)

This type of nursery is large in size (2500-10000 sq. meter area) and the main objective of such nursery is to earn money on investment. Costly nursery practices are usually avoided and there is an optimum utilization of available resources. Moreover, the control on quality of planting material is also reduced but quantity and types of plants are increased. Commercial nurseries should be located in the well connected cities, towns and in the villages. Average annual plantlet production of large nursery is more than 50,000.

### Components of Nursery

For starting up nursery as an enterprise, general idea about nursery components is needed. These are as under:

**Fence:** Prior to the establishment of a nursery, a good fence with barbed wire must be erected all around the nursery to prevent trespass of animals and theft. The fence could be further strengthened by planting a live hedge, with thorny fruit plants. This also adds beauty in bearing and also provides additional income through sale of fruits and seedling obtained from the seed eg. karonda, opuntia, ker, jharber etc suited to this arid region.

**Roads and paths:** A proper planning of roads and paths inside the nursery will not add only beauty, but also make the nursery operation easy and economical.

**Table 2.** Expected returns per year from khejri nursery

Particular	Quantity and rate	Gross returns (₹)	Net returns (₹)
Sale of budded khejri	(24,000 thousands) Rs. 35 each	8,40,000	3,88,000

\*Mortality of saplings in nursery before sale 10-20% (depends on kind of fruit crops)

progeny block or mother plants block will not only create confidence among the customers but also reduces the cost of production and increases the success rate of grafting/budding/layering because of availability of fresh scion material throughout the season within the nursery and there will not be any lag period between separation of scions and graftage. There are so many cultivars for fruit crops, grow only important cultivar in mother blocks as per demand and germplasm conservation.

**Irrigation systems:** Horticultural nursery plants require ensured supply of water for irrigation, since they are grown in trays, poly bags or pots with limited quantity of potting mixture. Generally, it is assumed that the daily requirement of water @ 200 litre per 1,000 seedlings for irrigation (depending on kind of soil and weather conditions).

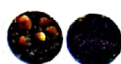
**Office cum stores:** An office-cum-stores is needed for effective management of the nursery. The office buildings may be

constructed in a place, which offers better supervision and also to receive customers. The office buildings of suitable sizes are needed for storing materials use in plant raising.

**Table 3.** Expected returns from ber, Citrus spp. and pomegranate saplings production

Particular	Quantity and rate (₹)	Gross returns (₹)
Sale of budded Kinnow/mosambi	24,000 (₹ 30 each)	7,20,000
Sale of budded ber	25,000 (₹ 30 each)	7,50,000
Sale cuttage/layers of pomegranate*	27,000 (₹ 20 each)	5,40,000

\*In case of pomegranate, cuttings can be obtained twice a year (late winter and monsoon) and double returns can be generated per annum.





**Seed beds:** In a nursery, this components is essential to raise the seedlings and rootstocks. These are to be laid out near the water source, since they require frequent watering. Beds of 1-1.5 meter width of any convenient length 10-15 meter are to be made. A working area of 60 cm between the beds is necessary. To avoid flow of water outside the beds in dry areas, usually 15 cm deeper than the normal ground level beds (sunken beds) are made.

**Nursery beds:** Raising of seedling / rootstock in poly bags requires more spaces compared to seed beds. Nursery beds area should also have a provision to keep the grafted plants either in trenches of 30 cm deep and 1 m wide so as to accommodate 500 grafts in each bed. Such beds can be irrigated either with a rose fitted to a flexible hose pipe or by overhead micro-sprinklers.

**Potting mixture:** For better success of nursery plants a good potting mixture is necessary. The potting mixture may be prepared well in advance by adding sufficient quantity of sand:clay:FYM and fill in polybags. For protray media mixture containing vermiculite, perlite and cocopeat gave better result.

**Propagation structures:** Propagation structures are useful for multiplication of grafts and seedlings. Generally, 200 m<sup>2</sup> polyhouse units with shadehouse of 400 m<sup>2</sup> and 15 m<sup>2</sup> mist chamber facilities are sufficient for propagation of fifty thousand saplings per annum.

### Profitability in a Nursery Enterprise

Nursery enterprise is mostly based on assumptions of demand of plants and availability of various production inputs like raw material and labour. It would therefore be wise to carry out market survey to anticipate demand of various plants in the coming season before production of plants in a nursery enterprise begins. The fixed and variable costs associated with establishment of nursery and expected return by saplings production activity will be helpful to assess the net returns of this activity. It is estimated that less than 10% of nursery established face losses during the initial three years period only.

Sale out of saplings from the nursery in common condition and return may be enhanced many fold by involvement of hi-tech infrastructure facilities that will reduce the loss.

Some important points to be taken into consideration for bringing nursery enterprise into a profitable venture are as follows:

- Production of saplings in a nursery is a commercial business activity and is to be seen from the point of view of economics of expenditure and returns.
- There is need to balance the technical aspects and practical feasibility of production and sale of plants in a nursery unit.
- The nursery enterprise may not start yielding profits right from the first year onwards but may require



minimum four to five years for planning and execution of operations and bringing the nursery business into profit.

- Records of expenditure and income need to be maintained regularly to ascertain the profitability or loss in the business. A critical analysis of such records may provide solution for overcoming the problem of poor profit.
- Monitoring of daily activities in nursery premises can provide immediate answers to the problems faced during the production and sale in nursery produce.
- There needs to be coordination among three important aspects of nursery enterprise i.e., production of plants, rearing of plants and sales of plants.
- Increasing the sales through marketing, publicity and advertisement.

### SUMMARY

For nursery enterprise to be a profitable venture, meticulous planning is required in the way of improving the availability of healthy planting material of improved/recommended varieties. The infusion of latest technologies has become essential for increased productivity. Presently, only 30-40% demand of planting material is being met by existing infrastructural facilities. The demand for horticultural produce is accelerating with passing time. Unless uniform planting material of desired type is available, increased productivity levels cannot be achieved. Hence, adoption of frontier technologies like hi-tech nursery for raising plantlets has to be encouraged. The responsibility of providing food and nutritional security to aspiring populace, coupled with projected growth rate of 7% can be met by various hi-tech inventions of which hi-tech nursery is the stepping stone. Educational and training programmes need to be strengthened for the development of human resource and sustainable progress in this direction.

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