



Study Notes

Raising and Management of Nursery

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Nursery

Nursery is a place where plants are cultivated until they are ready to be transplanted in the main field.

Raising nursery is important in view of obtaining higher yield.

It is of two types: **temporary and permanent**.

1. Temporary type of nursery is raised in open especially under sheltered position of tree or even in totally open condition.
2. Permanent type nurseries are generally permanently walled and often provided with overhead covering against rain or frost.

Benefits of Raising Nursery

- The area being small and compact, it is convenient and easy to grow large number of seedlings per unit area.
- Managing favourable growing conditions become easy and feasible.
- By raising seedlings prior to their normal season, off-season cultivation of vegetable is possible.
- As there is better germination due to properly managed conditions, nursery raising helps in curtailing seed requirement.
- As nursery raising necessitates transplanting, hence, it helps in getting higher yields in those vegetables which respond to transplanting.
- Nursery provides an opportunity to select healthy, uniform and proper seedling and, thus, helps in raising proper crop in the field.

Vegetable Nursery

- Generally, the small seeded vegetables like brinjal, chillies, tomato, cauliflower, cabbage, knol-khol and onion respond well to nursery raising and further transplanting.
- In these vegetables, consequent to the transplanting, numerous fibrous roots are generated.
- Bold seeded vegetables like pea, beans, cucurbits, okra etc. do not respond to transplanting. When the embryonic roots of these vegetables are damaged, they fail to produce lateral fibrous roots and consequently die.
- Root-crops like carrot, radish etc. also do not respond to transplanting.

Components of Nursery

- (i) Selection of location and site.
- (ii) Seed and sowing.
- (iii) After-care.

1) Selection of location and site

- Select the site under open and protected condition.
- Raised area is preferred for nursery as it facilitates drainage of water and avoid water stagnation.

2) Seed and sowing

- Seed should be sound, healthy, high yielding and true in the type. Seed should always be purchased from reliable source.
- Three types of seed treatment are used to control diseases: disinfestation, disinfection and seed protection.

Soil Treatment

- Soil may contain weed seeds, nematodes, fungi and bacteria that may be harmful for plants. These micro-organisms cause various diseases in vegetable crops.
- Soil treatment can be done through heat or fumigation.

Preparation of nursery beds

There are three types of nursery bed:

- (i) Flat nursery bed
- (ii) Raised nursery bed
- (iii) Sunken nursery bed

(i) Flat nursery bed

It is prepared:

- (a) During spring-summer when there is no fear of rain.
- (b) In the area where the soil is light sandy to sandy loam where there is no problem of water stagnation.

The area proposed for nursery is well-prepared till the pulverization of land and well rotten FYM at the rate of 10 kg per sq. metre is well mixed in the soil. The field is divided into small size plots. Ridges are prepared around each bed which facilitate the cultural practices. In between two rows of beds, central irrigation channel is prepared through which each bed is connected. This is very simple and easy to practise.

(ii) Raised nursery bed

- This type of nursery bed is common in practice.
- It is specially useful for raising seedlings during rainy season when stagnation of water becomes problematic and causes damping-off disease.

Raised bed of 10 to 15 cm height from ground level is prepared. All the stump, stones, pebbles etc. are removed from the bed and FYM at the rate of 10 kg per sq. metre is well mixed in the soil. In between two beds, a space of 50 to 60 cm is left so as to carry out cultural practices easily. The seeds are sown in lines over the bed.

(iii) Sunken nursery bed

- This type of bed is useful and prepared mostly during winter season.
- This type of nursery is prepared 10 to 15 cm downward from the soil surface.
- The air blows across the surface of soil and the seedling in sunken nursery is not hit by the cool breeze of the air. Furthermore, covering of sunken bed with polythene sheets becomes easy which is required for protecting seedlings from cool air.

SOWING

- The soil is stirred to a fine tilth by removing stones, pebbles, crop residues etc.
- FYM is added and the nursery bed of suitable size is prepared as needed.
- After sowing, the seeds are covered with very fine layer of sieved farm yard manure. Irrigation is provided using watering can with fine nozzle to avoid flooding of the seed.
- The plants are cared time to time until they are ready for transplanting in the field.
- During summer the plants are ready for transplanting in about 4 weeks and during winter after 6 to 8 weeks of sowing.
- At this age, the plants attain a height of about 15 cm and possess 4 to 6 leaves.

After-care

- To have better germination, uniform moisture level should be maintained in the seedbed. Avoid irrigation through flood system until germination of seed.
- Water stagnation in the bed should be avoided.
- Remove weed from the bed as they harbour pests and diseases.
- Cover the seed bed using thatch or gunny bag or locally available grasses to protect the seedling against hot and dry summer.
- During winter, the seed bed should be covered using polythene sheet.
- When germination of seed is over, the covering should be practised only during night. During day time, the beds should be exposed to sunlight. Exposition to sunlight provides heat and facilitates seed germination, if left any.

Time of nursery raising

- Generally, in India, there are two distinct seasons of vegetable cultivation : autumn- winter and spring-summer. The raising of nursery vary accordingly.
- For autumn-winter crop. the nursery is raised during June-July and that for spring-summer crop, it is raised during November-January.

ESSENTIAL OPERATIONS IN NURSERY RAISING

1. Thinning

The practice of removal of excess seedling to facilitate aeration and better development, is termed as thinning.

2. Pricking

- The transferring of young seedlings into another bed, pan or tray is termed as pricking.
- The operation of pricking is practised at the stage when the seedlings become large enough to handle.
- It is done with the objective of fast and vigorous development of seedlings and minimizing transplantable time.

3. Hardening off

This is a practice of exposing the plants to full sunlight and withholding the irrigation for about 7 to 10 days before transplanting so as to make the plant able to tolerate external growing conditions.

4. Mulching

Mulch is a thin extraneous layer of farm waste, crop residues, wood-chips, saw dust, ash, polythene or other similar material applied on the surface to conserve moisture in the soil.

RAISING AND MANAGEMENT OF NURSERY

After sowing seed, about 5 cm thick layer of mulch is applied over the bed. When seed germinates, the layer of mulch is removed.

GROWING MEDIA FOR RAISING NURSERY PLANTS

Different types of rooting media are used for germinating the seeds and sprouting cuttings. The following criteria should be considered while selecting the growing media for sowing the nursery plants:

- It should be firm enough to hold the seeds or plants at its place.
- It should be porous enough to facilitate air drainage.
- It should be retentive of enough moisture.
- It should be free from contamination. It should be preferably neutral in reaction.
- It should not denature upon pasteurization or steam treatment.

Some common growing media for raising the plants are:

1. Compost

- It is decomposed and rotten material of farm waste.
- Compost is rich in organic matter and adds to the growth and vigour of the plants.

2. Soil

For vegetable seeds mostly light soils are preferred. Growing seeds in such soils facilitate uprooting of seedlings when needed.

The seeds of fruit plants which are transplanted along with earth ball intact, are better raised in heavy soil. Such soils do not separate from roots so easily.

3. Sand

It is totally devoid of organic matter and nutrients. Hence, sand culture is mostly used for nutritional experiments to eliminate the biasness of the result as affected by base nutritional status of the growing medium.

4. Sphagnum moss

- Sphagnum which is used in layering is obtained after dehydrating living portion of the grass.
- It has very good water retention capacity and holds as much as 10 to 20 times more water to its weight.
- Due to this property, sphagnum finds commercial use as rooting medium in air-layering. It has a pH of 3.5-4.0.

5. Perlite

Perlite in combination with peat moss is a very popular rooting medium for cutting.

6. Vermiculite

- It is able to absorb large quantities of water.
- It has good cation exchange capacity and thus can hold nutrients in reserve and releases it slowly and slowly.
- Vermiculite contains enough magnesium and potassium needed for plants.

Peat

- Peat consists of the decomposed remains of aquatic, marsh or bog vegetation and sediment of water bodies.
- Depending upon the source of origin, the peat varies considerably in mineral content.

PROPAGATION STRUCTURE

Greenhouse

It is a structure constructed of cladding materials like plastic, polythene and fibre glass material having temperature control and ample light availability needed for propagating plants by seed, cutting and grafting.

Mostly translucent type of glass, which gives a uniform diffused light, is used for the construction of greenhouse.

As per requirements of season and types of plant to be grown, provision is made to heat and cool the greenhouse.

Lathhouse

It is a structure erected primarily to create shade to raise tender plants and to protect the plants from high temperature and light intensity.

Agro-nets of different shading intensities are used for erecting lathhouses.

By controlling light intensities, the lathhouse reduces moisture stress and decreases the water requirement of plants.

Hotbed

- It is a large wood box or frame with a sloping, tight fitting lid made of window sash.
- In hotbeds heat is provided below the propagating medium by electric heating cables, hot water, steam pipes, hot air fumes or fermenting manure.
- Hotbeds can be used throughout the year, except in areas with severe winter. In these areas its use may be restricted to spring, summer and early winter (September).

Cold frame

- Cold frame construction is similar to hotbed except that no provision is made for supplying bottom heat.
- It is used primarily in hardening rooted cutting or young seedlings before planting.
- It can also be used for starting new plants in late spring, summer or early winter (September) when no external supply of heat is necessary.

FRUIT NURSERY

Fruit plants possess considerable gestation period and come into commercial bearing after 3-5 years depending upon types of plant grown.

Parts of Nursery

1. Seed bed/planting bed

The cuttings are raised in planting. bed. The bed is generally prepared under shade which curtails water requirement of plants and helps in retaining better moisture in the nursery. The length of the bed is kept as per requirement. However, the width should not exceed 1-1.5 metre so that the intercultural operations can be carried out from external side without entering into the bed. Usually, for sowing seed and raising cutting, polythene bags of 25 x 10 cm size of 100 µ thickness are used.

2. Mother plant

The mother plants should possess the following attributes:

- It should be of known identity.
- It should have high production potential.
- It should have commercial acceptance. It should be free from pests and pathogens.

3. Packing yard

This is commercially important spot in the nursery. All the sold plants here. It should be located near office touching store-house.

4. Pot house

For inarching, rootstocks are required to be grown either in polythene bags or earthen pots. For such purpose, the shady place should be utilized as pot house.

5. Compost pit

It is prepared to decompose waste material to get compost. Compost is used as a medium for growing seedlings and raising cuttings. It is also used as a component in pot filling mixture.