# PRACTICAL 1 : PREPARATION OF LAY OUT OF A COMMERCIAL NURSERY

## 1.1 OBJECTIVES

Before establishment of a commercial nursery, proper planning and lay out is very essential. There are certain principles/points which are to be followed for planning and layout.

To objective of this exercise is to develop skill for planning and layout of a nursery. After doing this exercise, you will be able to:

- Select the site for a commercial nursery
- Decide what should be the components of the nursery
- Layout the nursery

For the establishment of a commercial nursery on scientific basis the following points have to be considered:

## 1.2 SELECTION OF SITE

**Location :**

- The selected site for establishing a nursery should be located in an established nursery area.
- The selected site should preferably be on the highway or at least connected with a good motorable road.
- The selected site should also have electricity and communication facilities.

**Soil :**

- The soil should be light to medium in texture with good fertility and sufficient water holding capacity along with good drainage.
- A soil pH of 6.0 to 7.0 is most suitable for any nursery.

**Topography :**

- The topography of the land should be plain with one per cent slope.

## 1.3 PLANNING AND LAYOUT

The following components are to be taken care and provisions should be made for these.

- **Fence :** Prior to the establishment of a nursery, a good fence with barbed wire must be erected all around.
- **Roads and paths :** A proper planning for roads and paths can be achieved by dividing the nursery into different blocks and various sections. Each road/path should lead the customer to a point of interest in the nursery area.
- **Progeny block :** The nursery should have a well maintained progeny block or mother plant block/scion block planted with those varieties in good demand.
- **Wells, pipelines, generators etc. :** Sufficient number of wells to yield sufficient quantity of irrigation water is a must in nurseries. An area where continuous power failure is there, provision of a generator is essential.
- **Office cum stores :** The office may be constructed in a place which offers better supervision and also to receive customers. A store house is essential to store different inputs.
- **Seed beds :** These are to be laid out near the water sources. Beds of 1 meter width of any convenient length are to be made. A working area of 60 cm between the beds is necessary.
- **Nursery beds :** Nursery bed 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/layers in each bed. Alternatively, the grafts/layers can be arranged on the ground in beds of 1m wide with 60cm working space in between the beds.
- **Potting mixture and potting yard :** The potting mixtures for different purposes can be prepared by mixing fertile soil, well decomposed FYM, leaf mould, oil cakes etc. in different proportions. The potting mixtures should be kept near the potting yard where potting is done.

## 1.4 STRUCTURES OF NURSERY

- **Shade houses :** Shade houses made with shade nets (25%, 50% and 70% shading effect) for regulation of shade are very useful.
- **Green houses/poly houses :** Grafting and budding of various fruit species under poly houses or low cost green houses with natural ventilation will enhance the percentage of success.
- **Standard rootstocks :** This is very much essential to produce uniform planting materials with better qualities by utilizing the standard rootstocks.

## 1.5 EXERCISE

A) Prepare (i) a plan of a commercial nursery considering the above points. (ii) Draw a sketch showing the location of different components of the nursery indicating the area allotted for each.

B) Prepare a list of different crops which are in good demand in your locality.

# PRACTICAL 2 : IDENTIFICATION OF TOOLS AND IMPLEMENTS FOR NURSERY

## 2.1 OBJECTIVES

In a commercial nursery various types of tools and implements are used for different purposes. In this exercise, you will identify the different tools and implements and know their uses in a nursery.

## 2.2 IMPLEMENTS

- **Khurpi :** An useful tool for weeding in the nursery and flower beds. It is used for lifting seedlings and plants from the nursery. It is an useful tool for transplanting and planting plants. The shape and the size determine the nature of work that can be taken with a khurpi.
- **Sickle :** It is used for cutting grass, fodder and harvesting crop. A sickle made of high carbon steel is better and lasts longer.
- **Shovel :** It is useful handy tool for lifting young seedling from nursery beds. It helps in lifting seedlings without much injury to roots. It is available in market in different shapes and sizes.
- **Hand Hoe :** Hand hoe is an effective and efficient tool for weeding in bed and gardens. It can be used for preparing basins, beds and seed beds. Long wooden handle enables to work without bending. Ideal steel for hoe is high carbon steel.
- **Rake :** It is an ideal tool for leveling land and collecting weed. It can also be used for breaking clods. Rake made of high carbon steel lasts long. A good rake should have 8-12 teeth.
- **Watering Can :** It is used for irrigating potted plants. When fitted with rose, it can be used for irrigating seed beds. They are available in various capacities.
- **Pruning Knife :** It is used for pruning branches and suckers. It can be used for grafting purposes also. The edges of the knife

remain sharp for a longer period if it is made from high carbon steel.

- **Budding Knife :** Used in budding operation. Curved point help in making vertical cut on the stock plant. The other end helps in opening the bark flaps. It can be used for making cutting, pruning young shoots and tender branches.
- **Grafting Knife :** Used in grafting operation, also for pruning and making cuttings. Grafting knives made from high carbon steel are better.
- **Pole Shear :** It is useful for pruning branches of outer periphery of the tree and are 3-4 meter high. The branch is fastened by opening the blade. The blade cuts the branches when rope or chain is pulled.
- **Secateur :** Secateur is for pruning branches of lead pencil thickness. It is good for making cuttings and removing dead flowers and branches.
- **Pruning Saw :** Used for cutting thick branches. It is more effective for removing dead and thick branches which are over 6 cm. in diameter.
- **Lopper :** It is an excellent tool for pruning branches thicker than a lead pencil. It is useful tool for making hard wood cutting.
- **Hedge Shear :** Used for trimming hedges and edges. Also used in making topiary.
- **Sprinkler :** Useful for irrigating lawn and kitchen garden. Water comes out as spray. There is economy of water as well and it also covers larger areas in shorter time.
- **Clipper :** Used for clipping soft grass of lawn and edge sides where lawn mover not covers.
- **Fork :** Used for lifting manures and plant. It is an useful garden tool in nursery preparation. It is also useful for shifting compost and garden rubbish.
- **Sprayer :** Sprayers are useful for spraying insecticide, fungicides or herbicides. It is also used for foliar application of fertilizers. It

should have a fine nozzle for uniform spray. Sprayers are available in the market in different capacities. They may be food operated or hand compressed sprayers.

- **Grass Cutting Sword :** Used for cutting grass or weeds from garden and lawn. It covers a large area in small time.

## 2.3 EXCERCISE

A) Identify and draw the various implements used in a commercial nursery. Describe the uses of each in the manual.

| Tools/Implements | Drawing | Uses |
|---|---|---|
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| | | |
| | | |
| | | |
| | | |

| Tools/Implements | Drawing | Uses |
|---|---|---|
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# PRACTICAL 3 : SEED BED PREPARATION, SEED SOWING AND RAISING OF VEGETABLE AND FLOWER SEEDLINGS

## 3.1 OBJECTIVES

The objectives of this practical are to help you in developing skill for:

- Preparation of seed bed
- Seed sowing procedure and
- Producing quality transplants

## 3.2 MATERIALS REQUIRED

Hoe, Watering can, Polythene sheet, Banana leaves, Bamboo, Thatch, FYM, Captaf /Fytolan /Formaldehyde.

## 3.3 PROCEDURE FOR RAISING SEEDLINGS

- Select a sunny area with well-drained friable light soil rich in organic matter
- Give a deep ploughing at least a month before preparation of nursery beds.
- The soil should be pulverized and beds of 1m width and 5-10m length are prepared which are to be raised 10-15 cm above ground level. Add 2 kg sand and 2 kg well decomposed compost to every $1m^2$ area.
- To make the soil free from soil borne pathogens, apply 0.1% solution of Captan or Fytolan or 4% Formalin so as to saturate the soil up to the depth of 10-15cm. Cover the beds immediately with polythene sheet or gunny bag or newspaper sheets for 2-3 days.

- Uncover the beds, bring the soil to a fine tilth for sowing seeds. The seeds are treated with Captaf or Thirum or Brassicol @ 3g/ kg of seeds before sowing thinly in the lines drawn 2-3cm apart. Provide light irrigation with a watering can fitted with fine rose and cover with a mixture of finely sieved garden loam, FYM and sand. Add 2g Malathion dust per kg of that mixture to cut down the insect damage. Finally cover the sown beds with banana leaves or bamboo mat or gunny bag or newspaper sheets which are to be removed as soon as germination is noticed.
- To protect the tender seedlings from heavy rain and scorching sunshine provide overhead shade. When the seedlings are 15-20 days old these shades are to be removed and irrigation is to be gradually reduced to harden the seedlings. The seedlings are ready for transplanting when those are 30-40 days old or 10-15 cm in height or at 3-4 true-leaved stage. In order to ensure proper establishment of costly seedlings, transplanting at a 2-3cm plant to plant spacing is to be done in a second nursery bed when the seedlings are at 1-2 leaf stage. Providing shade in the secondary nursery bed for 4-5 days immediately after transplanting is must.

## 3.4 EXERCISES

A) Prepare a seed bed of l m long following the procedure described above and sow seed. Also calculate how much Captaf will be needed for disinfecting 5 nursery beds of one metre length.

B) Do the following exercise :

| Crop | Seed rate | Seed required to produce 1000 seedlings | | | Seed required for sowing/10m² |
|---|---|---|---|---|---|
| | | 70% germination | 80 % germination | 90% germination | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

C) How much tomato seeds will be required to produce seedlings for planting in an area of 2500 $m^2$ at a spacing of 60cm × 45cm, if the seed lot has 80% germination?

# PRACTICAL 4 : ECONOMICS OF VEGETABLE AND FLOWER SEEDLING PRODUCTION

## 4.1 OBJECTIVES

The sole objective of any commercial venture by an entrepreneur is to gain maximum profit out of it. Any operation performed in the nursery should be to produce good quality saplings / seedlings with minimum expenditure. The owner of the nursery should make available all the inputs, stock plants at the locations, which is determined by the availability of inputs, mode of operation and cost of human labourers to be utilized. The economics of production has to be worked out for any vegetable crop production programme.

The profitability is determined by calculating the Cost : Benefit (C : B) ratio. The net return obtained may be higher with the highest level of inputs but the increased cost of production against total return brings down the C : B ratio of any enterprise.

## 4.2 EXERCISE

**A) Calculate the costs involved in different operations and inputs as shown in the table below :**

| Operation/Input | Unit/Bed | Rate (Rs.) | Total cost (Rs.) |
|---|---|---|---|
| **1. Cost of land preparation:**<br>a) Ploughing<br>b) Harrowing with tractor | | | |
| **2. Labour charges for different operations:**<br>a) Nursery Bed preparation<br>b) FYM application<br>c) Nursery bed treatment | | | |

| **Operation/Input** | **Unit/Bed** | **Rate (Rs.)** | **Total cost (Rs.)** |
|---|---|---|---|
| d) Seed sowing<br>e) Weeding<br>f) Irrigation<br>g) Plant protection<br>h) Uprooting | | | |
| **3. Material Input cost**<br>a) FYM<br>b) Fungicides<br>c) Insecticides<br>d) Seed<br>e) Any other | | | |
| **4. Miscellaneous cost (% of total cost)** | | | |
| **5. Total expenditure (1+2+3+4)** | | | |
| **6. Total seedlings produced** | | | |
| **7. Cost per 100 seedlings (Sale proceeds)** | | | |
| **8. Gross return** | | | |
| **9. Net return ( 8 – 5)** | | | |
| **10. Cost:Benefit Ratio (8 – 5)** | | | |

# PRACTICAL 5 : PROPAGATION BY CUTTINGS

## 5.1 OBJECTIVES

Preparation of cuttings of different types requires skill for successful propagation. The objective of this practical work is to develop skill for preparing different types of cuttings.

## 5.2 PROPAGATION BY CUTTINGS

Propagation by cuttings is one of the most important practices in the nursery. A cutting is a part of a plant which will first produce roots and then eventually a new plant which is quite true to the parent plant. A cutting may be a piece of stem, a leaf or part of a leaf, a piece of root, or even a scale of a bulb. The success in the propagation by cuttings depends upon factors such as conditions of the mother plants, part of the tree from where the cuttings are made, time of the year, care at the time of planting and after care. Cuttings can be made during spring- summer (February to June) season when active cell division is taking place.

**A. Root cuttings :** Propagation by means of root cutting is very simple and easy, and can be practiced in many plants like guava, apple, pear, cherry, persimmon, rhododendron etc. In root cuttings, adventitious shoots are regenerated. Plants which produce suckers freely in nature can easily be propagated by root cuttings.

The adventitious shoots develop mostly at the proximal end of the root, that is, the portion nearest to the crown of the root generally forms shoots. Hence it is essential to maintain correct polarity at planting; the proximal end of the root cutting should always be kept above soil when vertical planting is done.

Root cuttings are generally taken in early or late winter or early spring when the roots are well supplied with reserve carbohydrates.

**B. Stem cuttings :**

**Herbaceous cuttings:** The herbaceous cutting usually consist of the terminal leafy portion of stems of herbaceous plants like Dahlia, chrysanthemum, carnation, sweet potato etc. In general 7.5 to 12.5 cm long terminal portions of moderately vigorous shoots are selected for making cuttings and leaves are removed from the basal portions of the cuttings. The cuttings should be prepared just before they are placed in the rooting medium.

**Soft wood cuttings :** Cuttings made from soft, succulent, non-lignified new growths of some woody plants are known as soft wood cuttings. Moderately vigorous shoots growing on healthy plants under full sunlight are most suitable for making soft wood cuttings. Generally 10-15 cm long with terminal buds and at least two or three nodes on each cutting should be taken into consideration. Leaves are removed from the bottom node and the basal cut is made just below a node in slanting manner. The cuttings treated with auxins should immediately be planted at the rooting beds, eg: alamanda.

**Semi- hard wood cuttings :** When cuttings are taken from partially matured, slightly woody shoots are known as semi-hand wood cuttings. Semi hand wood cuttings are made 7.5 to 15 cm long with several leaves left at the terminal end but removed from the basal portions. The basal slanting cut is given just below a node. Best results are obtained when the cuttings are collected during the cooler part of the day, preferably in the morning, while the material remains turgid. Treatment of cuttings before planting with auxin is found to be beneficial.

**Hard wood cuttings :** Cuttings made from past season's growth or wood that has become mature and lignified are known as hardwood cuttings. As in the case of semi- hard wood cuttings should be taken from healthy, vigorous stock plants growing in full sunlight. These may be 10-30 cm or even more long and the diameter ranges from 1-1.5 cm or even more. Usually one

year old wood is preferred, but in some cases two year old shoot is used. It is common practice to give the top cut 1 or 2 cm above a node and the basal cut is given slightly below a node. A number of fruit plants like grape, fig, mulberry, gooseberry, olive, pomegranate etc. are propagated by hard wood cuttings.

**C. Leaf cuttings :** Certain plants with thick and fleshy leaves can reproduce themselves from leaf cuttings. Adventitious roots and an adventitious shoot develop on the leaf cutting. Many ornamental plants like bryophyllum, sansevieria etc. can be propagated by leaf cuttings.

In bryophyllum, well developed leaves are placed flat on the rooting medium and partially covered with the rooting medium. New plants soon arise from foliar embryos in the notches of the leaf margin. In case of sansevieria,5 to 10 cm long leaf sections are planted at the propagating frames maintaining the polarity. Within a month a new plant will develop at the base of the leaf cutting.

**D. Leaf bud cuttings :** A leaf bud cutting consists of a leaf blade, petiole and a small piece of stem containing a dormant vegetative bud at the leaf axils. Many species such as camellia, rhododendron, blackberry etc. can be easily propagated by means of leaf bud cuttings. About 1-1.5 cm of stem portion bearing an axillary bud usually taken the stem portion can be treated with auxin for better rooting. New shoots will develop soon and the axillary bud will sprout and develop quickly to form new complete plant.

## 5.2 MATERIALS REQUIRED

Cutting materials for different types of cuttings, Secateurs, Rootex or Rooton or Seradex.

## 5.3 EXERCISE

A) Prepare a list of crops along with the method of propagation by cuttings (Root cutting, Stem cutting, Leaf cutting, Leaf bud cutting).

B) Prepare different types of cuttings and record the success of rooting as per the following format.

| Types of cutting | Total No. of cuttings planted | Number of cuttings forming root on the days | | | Total No. of rooted cuttings | Per cent success |
|---|---|---|---|---|---|---|
| | | 15 days | 30 days | 45 days | | |
| **Root Cutting** | | | | | | |
| i) | | | | | | |
| ii) | | | | | | |
| **Stem Cutting** | | | | | | |
| i) Herbaceous | | | | | | |
| ii) Soft wood | | | | | | |
| iii) Semi-hard wood | | | | | | |
| iv) Hard wood | | | | | | |
| **Leaf Cutting** | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| **Leaf bud cutting** | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |

# PRACTICAL 6 : PROPAGATION BY GRAFTING

## 6.1 OBJECTIVES

The objective of this practical is develop skill for different types of grafting.

## 6.2 PROPAGATION BY GRAFTING

Grafting is a technique of propagation in which the scion and the rootstock are connected in such a manner that they unite and subsequently grow and develop into a successful plant .The new plant is known as a graft.

The four basic requirements for successful grafting are:

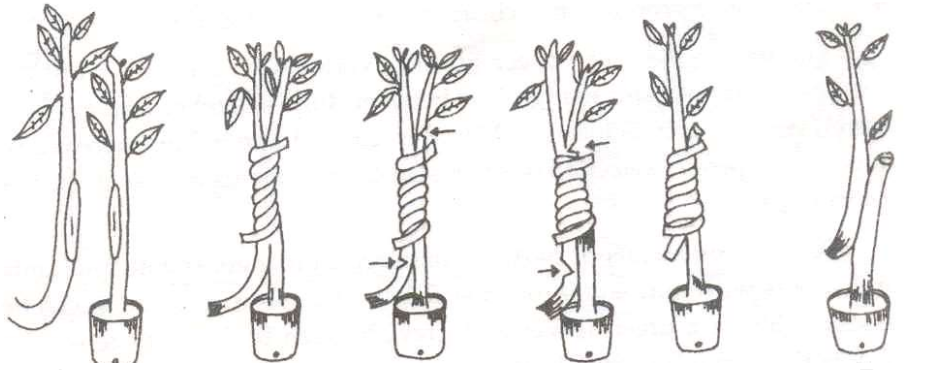
i) Compatibility between stock and scion,

ii) Age of the parts joined together,

iii) Wounding to expose cambium or other meristematic tissues and

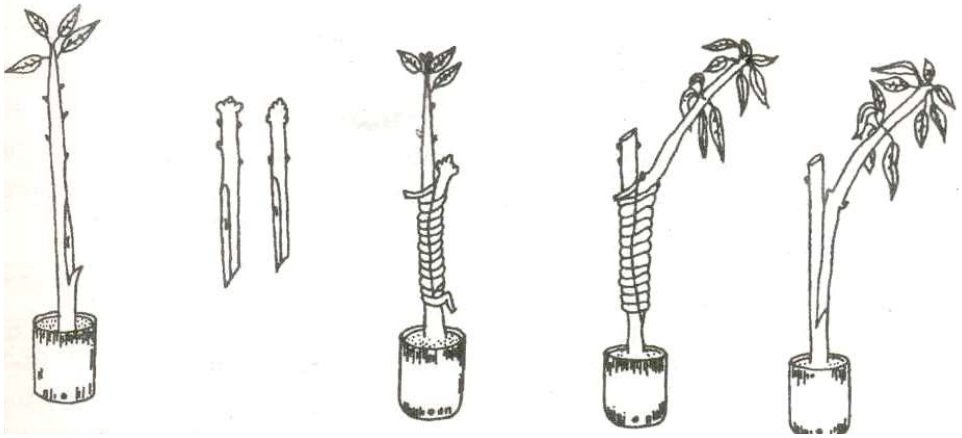
iv) Anchorage of the parts.

There are different types of grafting viz., Approach grafting, Veneer grafting, Soft wood grafting etc.



| A | B | C | D | E | F |
|---|---|---|---|---|---|
| Operated scion and stock with uniform slice of bark removed | Scion shoot and rootstock tied together | Separation of graft making first cuts | Second cuts made | Separated graft | Bandage removed |

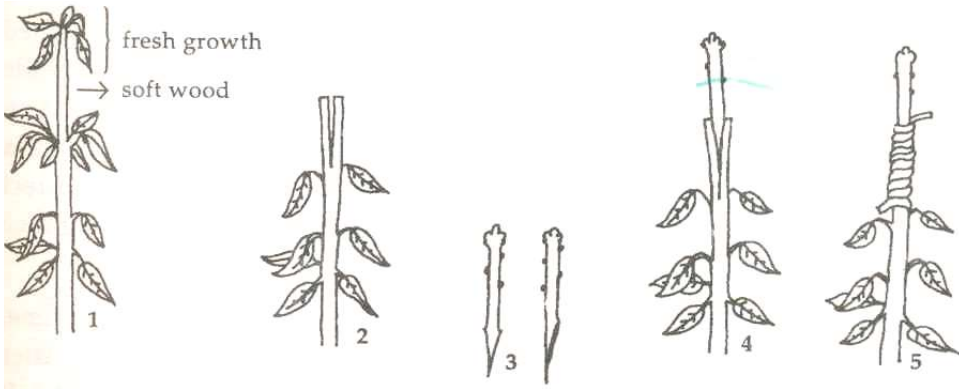
**Fig. 6.1 : Procedure of Approach Grafting (Inarching)**



(A) (B) (C) (D) (E)

A. Prepared rootstock, B. Prepaird scion, C. Scion grafted on stock, D. Deheaded stock and sprouted scion, E. Graft bandage remnoved

**Fig. 6.2 : Procedure of Veneer Grafting**




1. Root Stock, 2. Beheaded and prepared rootstock, 3. Prepared scion, 4. Scion inserted into stock, 5. Bandage completed

**Fig. 4.12 : Soft Wood Grafting**

## 6.3 MATERIALS REQUIRED

Grafting materials for different types of grafting (Root stock, scion), Grafting knife, Bandage material

## 6.4 EXERCISE

A) Practice the different types of grafting and describe the procedure of grafting.

# PRACTICAL 7 : PROPAGATION OF CHRYSANTHEMUM AND DAHLIA

## 7.1 OBJECTIVES

The objective of this practical is to develop skill in propagation and maintenance of Chrysanthemum and Dahlia.

## 7.2 PROPAGATION OF CHRYSANTHEMUM

There are mainly three methods of propagation of chrysanthemum, (a) Seeds, (b) Suckers and (c) Terminal cuttings.

Seeds are used for propagation of annual and single type of chrysanthemum and also for development of hybrid varieties. Suckers and terminal cuttings are used for propagation of large and decorative varieties and florist's chrysanthemum. Suckers are the side branches which arise from the underground portion of stem and grow horizontally below the ground level up to some distance and then come out and produce green leaves at their tips. Cuttings are the pieces of above ground portion of stem.

### 7.2.1 Procudure for Cutting

5-7 cm terminal cuttings are detached from the mother plants with the help of a sharp blade. The lower leaves are removed leaving 3-4 fully opened leaves at the top. A slanting cut is given just below a node. After preparation of the cuttings they are placed in a bucket containing water. The excess water is removed by giving a jerk to the cuttings and then the cut ends are treated with rooting hormone like rootex or seradex. They are then placed in the holes made in the already sterilized media with fungicide and placed at a spacing of 2.5 cm x 5.0 cm.

Cuttings can be made in beds, seed pans, pots, shallow boxes and polythene bags. Root primordia appear within 7-10 days

and cuttings are well rooted within 3-4 weeks. It mainly depends on cultivar, temperature, humidity, management practices etc.

## 7.3 PROPAGATION OF DAHLIA

Dahlia is commonly propagated by seeds, division of tuber and cuttings.

### 7.3.1 Propagation by Seeds

Dwarf bedding single dahlias are usually grown from seeds. Seeds are sown in Sept.-Oct. in northern India and March-April in hills. Seedlings are transplanted in beds or pots after about a month of sowing. However, plants are not true to the type.

### 7.3.2 Propagation by Division of Tuber

The double decorative cactus, pompon and other types of dahlia are generally raised from tubers. When flowering is over, the mother plant is headed back 15-20 cm above the ground level. After 7 days of heading back, the tubers are lifted out and dried in partial shade for 3-4 days. Then tubers are treated with fungicide and insecticide and stored in some earthen pot or floor and covered with sand. However, for commercial purposes, tubers are kept in cold storage in temp. 7.7-10°C.

For planting tubers are brought out from the cold storage during July-August (±15 days). Tubers are divided before planting. Each tuber should have some portion of crown for development of sprouts, eyes/buds.

### 7.3.3 Propagation by Cuttings

After the tubers have sprouted and the young shoots have come out and attained a height of 10-15 cm, small terminal stem

cuttings can be taken to raise new plants. Cuttings can be taken periodically from July to September.

The size of a cutting should be 8-10 cm. The cuttings should be solid. The lower leaves are removed and a slanting cut is given at the base just below a node. Then, the cut ends are dipped into a rooting hormone like Seradox or Rootex or Rooton and then planted in rooting media i.e., pure sand, sand, peat moss, vermiculite etc.

## 7.4 MATERIALS REQUIRED

Mother plant, Rooting media, Rooting hormone, Sharp blade, Water.

## 7.5 EXERCISE

A. Prepare cuttings and plant in appropriate rooting media and observe the rooting.Record the following observations in the format provided below:

| Crop | Media | Total number of cuttings planted | No. of cuttings forming roots on days after planting | | | Total no. of rooted cuttings | % success |
|---|---|---|---|---|---|---|---|
| | | | 7 | 14 | 21 | | |
| Chrysanthemum | | | | | | | |
| Dahlia | | | | | | | |

# PRACTICAL 8 : PROPAGATION OF BLACK PEPPER AND BETEL VINE

## 8.1 OBJECTIVES

Black pepper and betel vine are two creepers. The objective of this practical is to acquaint you with multiplication methods of black pepper & betel vine.

## 8.2 METHODS OF MULTLIPICATION

### 8.2.1 Vine Cutting

25 to 30 cm long vegetative shoots / stem having at least 2 to 3 nodes from the mature vine, having sufficient adventitious roots may be planted directly near the standard (i.e.the supporting plant on which it will climb) .Before planting, a small pit of about 30cm x 30 cm x 30 cm size, filled with organic rich soil may be prepared about one meter away from the standard. Selected vine may also be planted in poly bag or nursery bed filled with 1:3 FYM and garden loam. Roots will emerge from the nodes and those will be ready for transplanting in 2 to 3 months. For better establishment of the saplings, raising in the poly bags is the best.

### 8.2.2 Leaf Bud Cutting

A full grown leaf with a portion of stem having a dormant bud is taken for multiplication. Before inserting in the rooting media the stem end may be treated with root promoting hormone for higher success.

### 8.2.3 Rapid Multiplication Technique

A trench is prepared which is 75 cm deep, 30 cm wide and length according to convenience. It is then filled up with a mixture

of sand, FYM or garden loam in 1:1:1 ratio. 1.5m long split bamboos is placed near the trench at an angle of 45 degree at 30 cm spacing and filled up with 1:1FYM and garden loam mixture. The vines are allowed to climb up on the splits. A liquid fertilizer mixture is prepared by mixing 100 g urea, 75 g SSP, 50 g MOP and MgSO4 and applied @ 250ml/vine at monthly interval. The vines are tied so that nodes touch the rooting mixture. As the tip of vine reaches the other end the base is crushed to encourage rooting at nodes. Each node with roots and shoots is separated to get a new plant. One vine can give rise to 30 to 40 propagules in a season if the growth is vigorous and healthy.

## 8.3 MATERIALS REQUIRED

Fully grown vine, sand, FYM, garden loam, IBA powder.

## 8.4 EXERCISE

A) Make leaf–bud cuttings of black pepper and record the rooting percentage after 30-45days.

B) Record the number of nodes/vine in the existing rapid multiplication block, detach the rooted nodes plant in polythene sleeves.

# PRACTICAL 9 : PROPAGATION OF COCONUT AND ARECANUT

## 9.1 OBJECTIVES

After doing this exercise, you will be able to :

- Select ideal mother palms for collection of seed-nuts
- Learn the procedure of sowing nuts in nursery beds
- Judge out quality saplings

## 9.2 SOWING OF COCONUTS

30 cm raised beds are prepared to a dimension of 1m wide and length according to convenience. The nuts should be sown at 30cm distance horizontally with the widest segment facing upwards to help plumule emergence. The viable nuts on getting ideal conditions germinate within 30-45 days. A seedling requires about one year to come to the transplantable stage.

### 9.2.1 Judging the Seedling Quality of Coconut

a) Seedlings (Sept. Oct/March-April Planting) should be 1yr old.
b) Seedlings with early splitted leaves and having 5-6 leaves/ seedling.
c) Seedling possessing a stout collar.

## 9.3 SOWING OF ARECANUT SEEDS

a) Weight of nut for sowing should be 40 g.
b) Nuts should be planted vertically/horizontally 15cm apart. Best time of planting is from April to June.
c) Adequate shade should be provided when the seedlings are in nursery. On attaining 25-30cm height, those are transplanted in a second nursery bed at 30 x 30cm distance. In secondary beds

the seedlings are kept until 18 months old before planting in main plot. Banana *cv.* Giant Cavendish can be planted in between the rows for providing shade and an extra income can be obtained as well.

### 9.3.1 Judging the Seedling Quality

To evaluate a good quality seedling the following formula is adopted : (40 x no. of leaves) – height in cm = Q

If the value of Q > 50, the seedling in question is an ideal seedling.

## 9.4 MATERIALS REQUIRED

Farm yard manure, Sand and seed nuts.

## 9.5 EXCERCISES

A) Prepare a bed for sowing of nuts and sow the nuts.

B) Record the following observations:

| Crop | Total number of nuts sown | Per cent success |
|---|---|---|
| **Coconut** | | |
| **Arecanut** | | |

# PRACTICAL 10 : VISITS TO COMMERCIAL NURSERIES

## 10.1 OBJECTIVES

The objective of the visits is to acquaint you with the on the spot activities of the commercial nursery.

- To see the commercial nurseries practically.
- To know about the planting materials in demand.
- To observe the practically viable procedures of production and marketing of nursery commodities.

## 10.2 VISIT TO COMMERCIAL NURSERY

A) You will visit a few commercial nurseries. During the visit you should collect the following records /information.

| | | | |
|---|---|---|---|
| A) | Name of the Nursery/ Proprietor and Address | | |
| B) | Date of visit | | |
| C) | Year of establishment | | |
| D) | Professional training, if any | | |
| E) | Total nursery area<br>At the beginning _____ | | At present _____ |
| F) | Infrastructural facilities available | | |

| Sl. No. | Particulars | Unit |
|---|---|---|
| 1. | Greenhouse | |
| 2. | Low cost Greenhouse | |
| 3. | Shade net house | |
| 4. | Pump set | |
| 5. | Generator | |
| 6. | Out let in market | |
| 7. | Selling cart | |
| 8. | | |

| | | | |
|---|---|---|---|
| | 9. | | |
| | 10. | | |
| | 11. | | |
| | 12. | | |
| | 13. | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | | |
|---|---|---|---|---|
| G) | Employees/Labour | | | |
| | Permanent | | Seasonal | |
| | Male | Female | Male | Female |
| | | | | |

| | | | |
|---|---|---|---|
| H) | Crops multiplied in the nursery | | |
| | Crop | Method | Season |
| | | | |

| | |
|---|---|
| I) | Sources of plantlets/stock materials |
| J) | Total annual turn over |
| K) | Scope of Nursery Business as self employment |

| | | | |
|---|---|---|---|
| Very good | Good | Fair | Not promising |
| | | | |

B) Prepare a note on the nursery you visited regarding the layout of the nursery, progeny block, special nursery products, if any, structures maintained, any specific advantages or disadvantages of the nursery and overall performance of the nursery.

**Visit Note(s)**