



Vishwendu Vidya Prasarak Mandal's  
(Regd. No: MAH 1906 / F-1614; Dt.5/3/1987)

Abhinav Vidyalay & Junior College

(Govt. Regd. No. Prim.Edu. 6-970,90-91 Dtd:16-8-90; Index No: Sec:16.17.019 / 020;  
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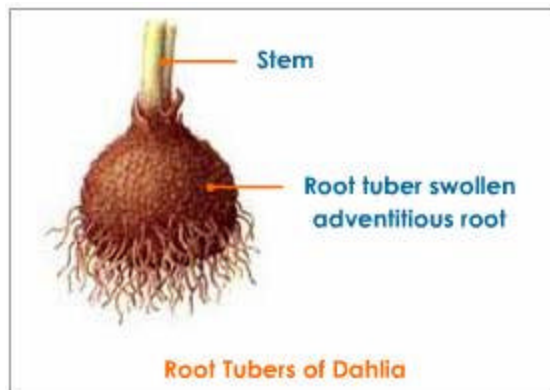
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### B12Ph8\_Natural Methods

Vegetative reproduction by natural methods is very common among seed plants. Vegetative organs such as roots, stems & leaves bear adventitious buds & bring about the formation of new plants.

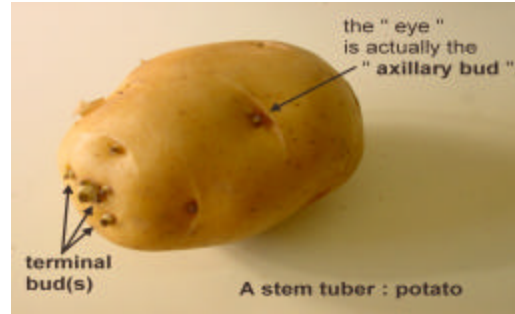
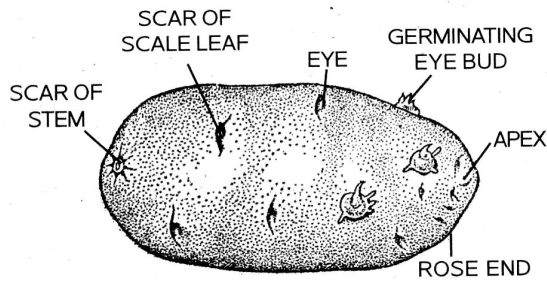
- 1) **Vegetative reproduction by roots:** The roots of some plants develop adventitious buds on them. E.g; Daldergia (Shisham), Guava, Murraya, Albizzia lebbek, etc. Some tuberous adventitious roots besides possessing adventitious buds also contain sufficient quantities of food, e.g; Dahlia & sweet potato. These buds sprout under suitable conditions. These sprouts may be separated & planted. In Shisham (Tahli) young fast growing shoots will arise from the roots around the cut stumps of trees.

**Example: Sweet potato (Ipomoea batatas):** It is a modification of adventitious roots. These roots grow from the nodes of a running stem & they are irregularly swollen due to the storage of food, hence they are called tuberous roots. They are called simple tuberous because they arise singly (one at each node) & not in clustures. They even give rise to adventitious buds which when detached, can give rise to new plants, thus performing the function of vegetative propagation.

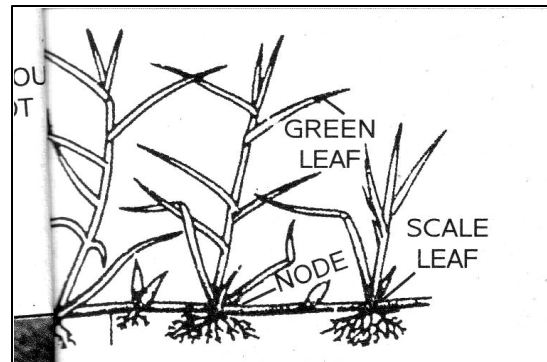
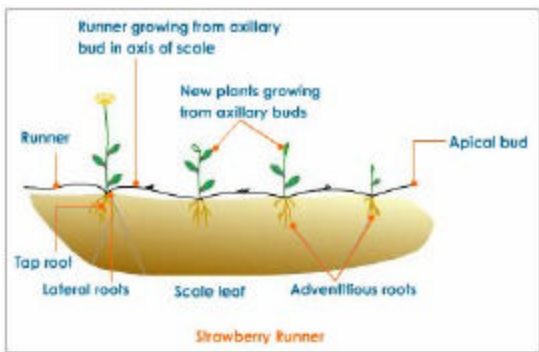


- 2) **Vegetative reproduction by stem:** Aerial weak stems (runner, stolons) when they touch the ground, give of adventitious roots. Thereafter, if connection breaks from the parent plant, the portion with newly formed roots develops into an independent plant. Stolon is also a weak aerial shoot which helps in vegetative propagation. E.g; Vallisneria. Straggling & branched rhizomes also reproduce by vegetative propagation. E.g;Banana, Ginger, Turmeric. Decay of older parts isolate the newly formed branches. The latter henceforth leads an independent life. Corms like Colocasia (Kachalu), Freesia, Crocus etc. have sufficient stored food & also bear many adventitious buds. A bulb also bears a number of buds E.g; Garlic & Narcissus. The buds are separated & develop into new plants.

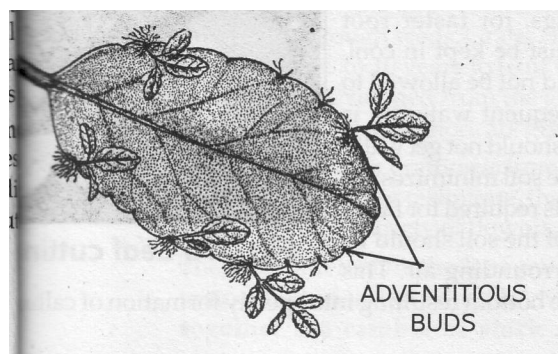
· **Stem Tuber:** Tuber of potato is a swollen apical part of an underground stem branch & bears number of nodes or eyes. Each eye bear one or many buds. New plants are produced from the buds present on the eye. The suckers of Mint & Chrysanthemum also serves as organ for vegetative multiplication. Bulbils are small, fleshy speacialized buds. They fall on the ground & produce new individuals. E.g; Agave (Century plant), Dioscorea & Pineapple. In agave flower buds develop into bulbils which drop on ground to produce new plants thus doing vegetative propagation from reproductive organs. Underground stem of potato, Onion & Zamicand are used for vegetative propagation. The plants with subaerial modification like in Pistia, Eichhornia & Pineapple are used for multiplication of plants.



- Runner:** The runner is a slender prostrate branch with a short & long internodes. It rises from the base of the plant. It creeps on the ground & roots at nodes. Runner arises from the axillary bud & creeps away some distance from the parent plant. It produces roots & grows into a new plant. It may break off the parent plant. Many runners are produced from a mother plant. They spread on the ground on all sides. On getting detached from the parent plant, the shoot develops as independent plants. The runner is meant for vegetative propagation. E.g: Cynodon, Strawberry, Grass etc.



- Vegetative propagation by Leaves:** In some plants adventitious buds are developed on their leaves. E.g; Bryophyllum, Begonia, Streptocarpus, Kalanchoe & Saintpaulia. In Bryophyllum notched margins of succulent leaves bear adventitious buds. These buds usually remain dormant, when the leaf is attached with the plant. However, when the leaf comes in contact with the soil, develop new plantlets along the margins. However, in some species of Bryophyllum, plantlets develop along the margins of intact leaves. In Begonia & Sensevieria adventitious buds are produced at the place of injury.





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### B12Ph8\_Artificial method

#### 1. Cutting :

Any portion of a plant, a piece of stem ,leaf or root ,which has been removed from a plant with the object of inducing it to strike roots and thus begins an independent existence, is called cutting.

##### Stem cutting

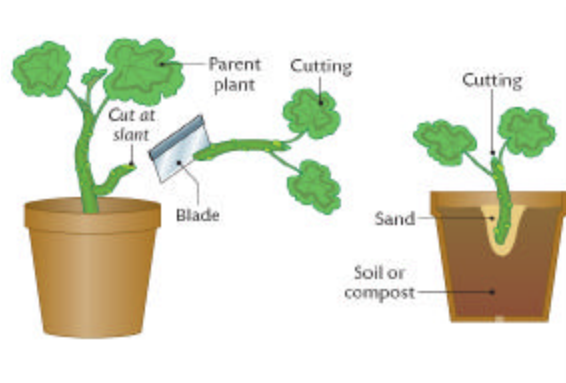
Make a clean slanting cut under the node either from the apical or from the basal Portion of the stem. Snip off the lower leaves with a sharp knife, so that bare stem is left for planting. Reduce the upper leaf to half of their length to reduce the rate of transpiration. Leave the cuttings aside for few hours to 2-3 days for the accumulation of sap at the cut end which helps in callus formation to prevent decay. Make holes in the soil & place the cutting gently in the hole & press the soil firmly around the stem. Water the cuttings lightly & keep the soil well drained & well aerated. After a few days observe the adventitious roots given out from the underground node.

##### Root cutting

Cut the piece of 3 -10cm length from the lateral roots having one or more buds on it. Press the piece horizontally in the soil. Water it lightly & keep the soil well drained & well aerated.

##### Leaf cutting

Insert the petiole of Begonia leaf in the moist soil or sand with leaf blade resting on the soil surface. Cut the large veins lengthwise for some portion. Press the cut portion into the soil & add a small pinch of soil above the cut. From the cut portion, adventitious roots are given out.



#### 2. Budding :

It is the insertion of the mature bud (scion) with the piece of a bark underneath the bark of the stock plant in such a way that the exposed tissues of both stock & scion are brought into contact with each other. It is followed by binding the part operated upon. It is carried out as follows:

Choose the stock & scion from the same variety or from the different varieties of the same species or from the different species of the same genus. The bud (scion) should not be too young or too old & the stock should be hard & suited to local climatic & soil conditions.

Choose a suitable bud from a young shoot of the current year. Make a clean slopping cut by inserting the knife about 1.5 cm below the bud & passing it upward & inward till under the bud & then outward in such a way the a piece of

the shape of a shield with the bud in its middle, is detached from the shoot. The piece should contain a small piece of bark behind the bud.

Make the T – shaped slit up to the bark of the stock without injuring the wood beneath.

Insert the bud into the T-shaped slit in such a way that the tissue of both scion & stock come in contact with each other.

Tie both together by a polythene tape or plantain fibre, beginning below the T – shaped slit, proceeding to the top & leaving the bud peeping through the turns of the tie. Tie the knot about the slit. Complete the whole operation in minimum time to prevent drying of the exposed tissues.

Once the bud develops into shoot, cut off the stock 7cm above the bud & smear the cut portion with lead paste or tar. Remove side shoots or suckers of the stock constantly as they take good deal of nourishment from the stock without leaving enough for the bud.

### 3. Grafting:

It is an operation in which two cut surfaces of the same or different plants are so placed as to unite & grow together. The plant on which grafting is done is called stock & the plant part is inserted on a stock, is called a scion or the graft. Grafting is done to transfer certain characters such as vigour, disease resistance etc. from stock to scion. These characters are sometimes difficult to transfer to the offspring's through the seeds. Grafting gives rapid results. For instance, the sapota plant take 8 – 10 years to fruit when developed from the seed & only 2-3years when developed from the graft. The best season for grafting is from Feb. – Jun as it is the growing season for the tree.

There are different methods of grafting depending upon the shape of the cut given to stock & scion, but the principle involved is the same i.e bringing together the cambia of stock & scion for union.

**Splice Grafting:** In splice grafting, both scion & stock are cut across obliquely at the same angle & then tied firmly with plastic lope.

**Whip Grafting:** This is a kind of grafting in which both scion & stock are cut diagonally. A vertical incision is made in the stock. One end of the scion is trimmed wedge shaped structure. The wedge shaped scion is then inserted into the vertical incision of the stock. It is then covered with grafting clay & wrapped with rags. After one month, a new plant develops from this graft.

