Vegetative Reproduction

Plants vegetative parts such as root, stem and leaf is used to produce new plants.

Natural Method	Artificial Method
Roots	Cutting
Stems	Grafting
Leaves	Layering
(Rhizomes, Bulbs, Tubers, corms).	Tissue culture

Runners

Oxalis and grass:- Horizontal stems will produce new roots and nodes and then shoot grow upwards forming new plants at frequent intervals.

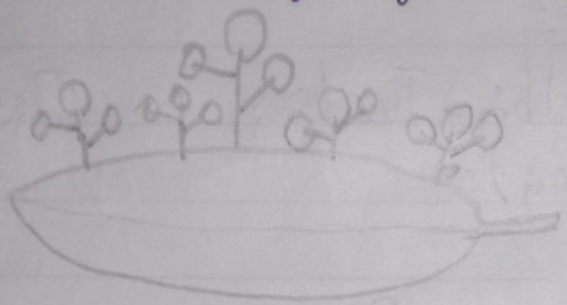
Chrysanthemum and mint:- Horizontal stems arise from the base of the erect shoot come out to form new aerial shoots and it become independent plants.

Vallisneria:- Arched stems which cross over small obstacles develop small plantlets at their nodes.

Leaves

Leaves develop small buds called adventitious buds, on their margin. This grow into new plant once get touch with soil.

Ex.- Bryophyllum



Asexual Reproduction

Formation of new plants from the cells of a single parent.

Budding

A small bulb-like cellular out growth, called bud is formed on parent cell that develops into an independent organism. E.x.- Yeast

Fragmentation

The adult organism breaks up into two or

more pieces called fragments, which grows to become a new plant. Ex. - Spirogyra

Spore Formation

Parent plant produce microscopic single or multicelled spherical bodies which germinate into new plants during favourable condition.
E.X. - Mosses

Multiple fission

⇒ In multiple fission, a single cell divides into many daughter cells simultaneously.

⇒ For Example :- Plasmodium and Amoeba

Binary Fission

⇒ Cell elongate DNA is replicated.

⇒ Cell wall and plasma membrane begin to constrict.

⇒ Cross-wall forms completely separating the two DNA copies.

⇒ Cells separate.

Vegetative reproduction by roots

⇒ Vegetative reproduction by roots :- Carrot and sweet potato are examples of modifications of roots ; for food storage. These roots can give rise to new plants ; when kept under the soil.

Advantages of Vegetative reproduction

⇒ Useful to grow seedless varieties.
⇒ Faster and easier than the natural process.
⇒ Offspring resemble the parent exactly.
⇒ The only method of reproduction for plants which do not produce seeds. Example :- Banana and rose.

Disadvantages of Vegetative reproduction

⇒ Being identical in all respects, these plants may be prone to disease at the same time.

⇒ Dispersal cannot occur naturally so there tends to be overcrowding

Natural Vegetation Propagation

- By stem :- Some plants reproduce by means of stem straggling and branched rhizomes reproduce by vegetative reproduction.
Example :- Banana, ginger turmeric.

Stem Tubers are found in potato and Artichoke. Tuber of potato is a swollen apical part of an underground stem branched bears a number of nodes or eyes. Each eye bears one or more bud. New plants are produced from the buds on the eyes. The potato crops is raised by tubers and not by seeds.

Artificial Vegetative Propagation

Cutting

⇒ Cutting is removing a part of the stem and planting it into the soil to allow the growth of roots and buds.

⇒ For Example :- Sugarcane, rose, china rose, pears.

Grafting

⇒ A small branch is cut from the plant to be grown with a wedge-shaped end. This is called scion. Now a V-shaped cut is made in the stem of a rooted called stock. The scion is now fitted into the stock and these taped together. Soon the graft becomes part of the rooted plant.

Layering

⇒ The lower branch of a plant is selected and a ring of the bark is removed from the stem. The portion where the bark is removed is bent and covered with soil. The branch is kept covered with soil for few days during which new roots start to develop on the branch. The branch is then cut off from the parent plant and allowed to grow as an individual plant. For Example :- Rose, jasmine, hibiscus, bougainvillea.

Benefits Of Plant Tissue Culture

⇒ The new plantlets can be grown in a short amount of time.

⇒ Only a small amount of initial plant tissue is required.

⇒ The new plantlets and plants are more likely to be free of viruses and diseases.

⇒ The process is not dependent on the seasons and can be done throughout the year.

Tissue culture

⇒ Tissue culture is one of the ways of cloning plants. It works with small pieces of plants called explants.

⇒ The technique of developing new plants from a cell or tissue in a nutrient medium under aseptic conditions. The cell or tissue is placed in a nutrient medium where it forms a mass of cells called callus. This callus is then transferred to another nutrient medium where it differentiates and forms a new plant.

Parts of Typical Flower

A flower is a modified shoot with a limited growth. Flowers vary in size, shape, structure and colour. The main parts of a flower are:-

⇒ Calyx ⇒ Corolla ⇒ Gynoecium

⇒ Androecium

Parts Of Flower

Sepals - Sepals are green structures that protects the inner parts of the flower when it is in bud stage.

Petals - Petals are colourful and attract the insects for pollination.

Stamens - Stamens are male reproductive parts and produce pollen grains that contain male gametes. Stamen has two parts -

* Filament - stalk

* Anther - swollen top part which has large number of pollen grains.

Agents of Pollination

⇒ Wind ⇒ Water ⇒ Animals ⇒ Insects

Artificial Pollination

⇒ Artificial pollination is the dusting, often by hand, of fertile stigmas with the pollen from plants with desired characteristics.

⇒ Pollen from the male stamens is collected and used to dust the stigmas.

⇒ Again, plants with the most desirable characteristics are selected for breeding in this way.

⇒ Both techniques can result in rapid and widespread change within populations of organisms.

Artificial Pollination

2. Ways and means of emasculating and pollin

Emasculation:- insert forceps or thumbnail into a crown base, remove the corolla and anther around the ovary.

Bagging

Covering the stigma with a thin polythene is known as Bagging.

Process Of Fertilisation

⇒ The pollen tube enters into the embryo sac through micropyle. At this time, the pollen tube bursts open, gametes released from the pollen tube and enter into the embryo sac. One of the gametes fuses with the egg and the other fuses with the secondary nucleus. The fusion of a male gamete with egg is known as fertilization. The fertilized egg is known as zygote which develops into embryo.

Regeneration

In this form, the body of the parent breaks into distinct peices, each of which can produce offspring.