PLANT TISSUE CULTURE AND ITS APPLICATION

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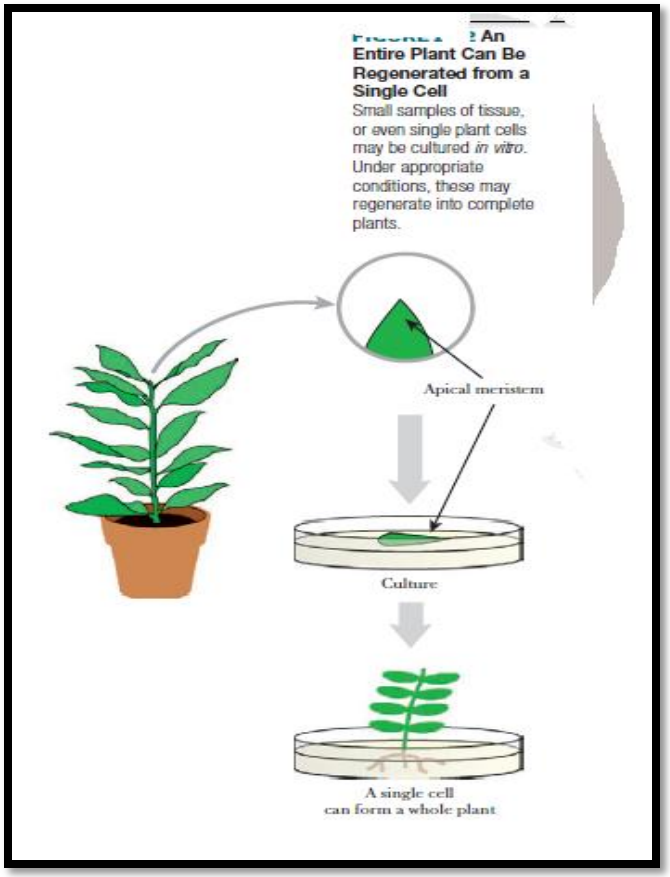
Plant tissue culture

- DEFINITION: Tissue culture is invitro cultivation of plant cell or tissue under aseptic and controlled environmental condition in liquid or semisolid well defined nutrient media for the production of primary and secondary metabolite and regeneration of plant.
- Two unique properties of plant tissue : A.Totipotency: Ability to regenerate total plant from a single cell.
- B.Plasticity: property of adaptibility in new environment.

Types of explants

An entire plant can be regenerated from a single cell,i.e explant; and the process is called totipotency.
Here the single cell may be of different types.It may be an embryo or endosperm orleaf or pollen or callus or anther or others.



Advantages of tissue culture

- Regular and uniform supply of raw materials.
- Overcome fluctuation in quality.
- Disease free plant production.
- Easy purification and biosynthesis of chemical compounds.
- Crop improvement.
- Biosynthetic pathway

- Requirements

1. Culture vessels and glass goods.
2. Autoclave.
3. Hotairoven
4. Incubator
5. Laminar air flow and others.

Micropropagation

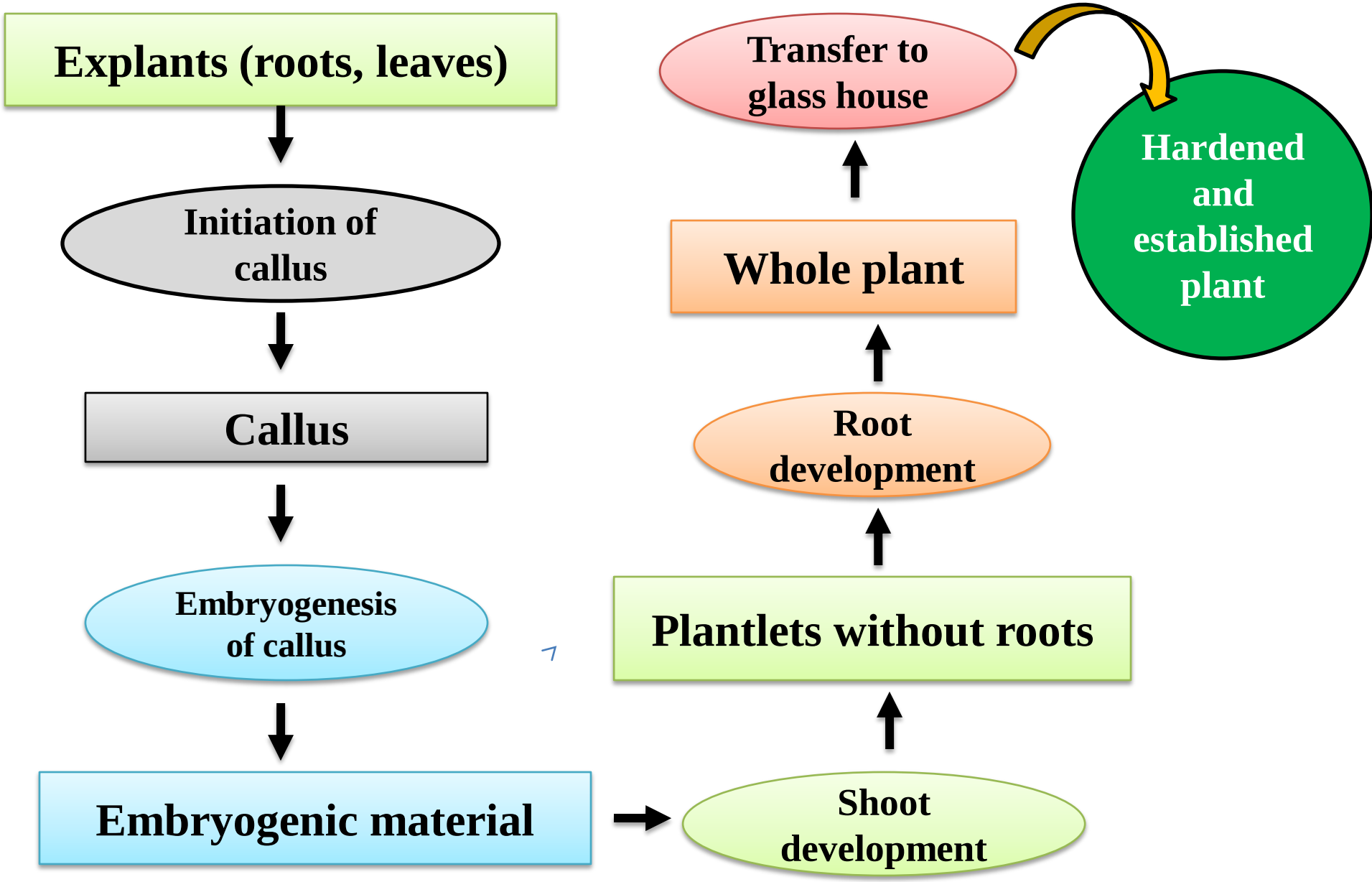
In nature, the method of plant propagation may be either asexual or sexual multiplication of genetically identical copies of a cultivar by asexual reproduction called clonal propagation. Clonal propagation through tissue culture is popularly known as micropropagation.

- Use of tissue cultue through micropropagation was introduced by G. Morel (1960), who found this as the only commercial approach for orchid propagation.

- **Plants obtained from tissue culture are called microplants.**

- **There are five stages in micropropagation:**
  1. **Preparation of explants.**
  2. **Formation of callus.**
  3. **Shoot development.**
  4. **Root formation.**
  5. **Transfer to a glass house.**

Process of micropropagation



Application of plant tissue culture