Meristem culture

- Apical meristem is the mass of tissue located at the extreme tip of shoot. Along with the young leaf primordia constitute the shoot apex.
- For the development of **disease-free plants**, meristem tips should be culture.
- Meristem or shoot tip is isolated from a stem by a V- shaped cut.
- Explant should be taken from the actively growing shoot tips.
- The most widely used media for meristem culture are MS medium and White's medium.
- The optimum temperature for culture is in the range of 20-28◦C. Lower intensity of light is more appropriate for the good micropropagation.

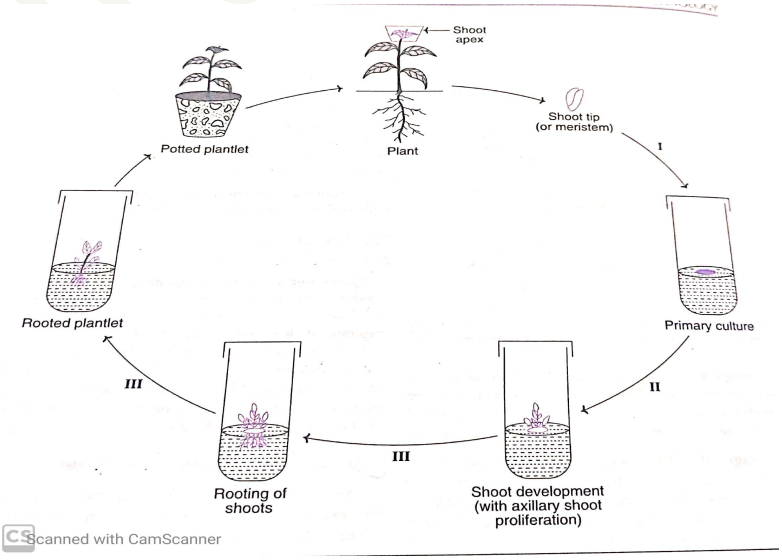
Stages involved in meristem culture:

Stage I: In this stage, the culture of meristem is established. Plant growth regulators namely Cytokinins (kinetin, BA) and Auxins (NAA or IBA) are added to the culture medium so that support the growth and development by inducing shoots and roots respectively.

Stage II: In this stage, shoot development along with axilary shoot proliferation occurs. High levels of Cytokinins are required for this purpose.

Stage III: In this stage, rooting of shoots and further growth of plantlets takes place. **For the well rooting, concentration of Auxin should be higher than Cytokinin**.

(**Root= Auxin > Cytokinin, Shoot= Cytokinin> Auxin**)



Process of Meristem culture:

1. Remove the outer leaves from the shoot.
2. After the removal of all outer leaves, the apex is exposed.
3. Excised/ cut off the ultimate apex with the help of scalpel and make size of less than 1mm length
4. The small pieces are surface sterilized and transfer to the culture medium.
5. Incubate the culture under aseptic condition for 16 hours at 25^0C
6. As soon as the growing single leafy shoot or multiple shoots obtained from single shoot tip or meristem, transfer them to hormone free medium to develop roots
7. The plants are later transferred to pots containing compost and kept under green house condition for hardening.