PLANT GROWTH AND DEVELOPMENT

CL 11 CH15

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- All plant organs are made up of various kinds of tissues which occupy specific locations within an organ and perform specific designated functions.
- Thus, the development of a plant follows a very precise pattern, during this period complex body organization is formed, i.e., produces, roots, leaves, branches, flowers, fruits, seed which finally dies.

- **Plant Growth Generally is Indeterminate**
  Growth of plant is unique as they retain the capacity for unlimited growth throughout their life. In plants the growth is generally confined only to the meristematic tissues present at certain locations in the body. Meristems in the plant have certain cells that have the capacity of dividing and self-perpetuation.
- The new cells produced by the action of division of meristematic cells, soon loose, the ability of dividing and make up the plant frody.
- The form of growth in which newly producing cells are always being added to the body erf the plant by the activity of meristems is called open form of growth.
- If the meristem ever ceases to divide, the growth of I the plant will not occur and they may undergo a j period of dormancy depending upon the seasonal j changes in the climate.

DIFFERENTIATION, DEDIFFERENTIATION AND REDIFFERENTIATION

- Differentiation – cells from the root , shoot apical meristems and cambium differentiate and mature to carry out different functions. Here the cells undergo some major structural changes both in cell walls and protoplasm
- Dedifferentiation- differentiated cells, after losing the capability to divide, regain the capacity of division in some circumstances. Example – cork cambium forming fully differentiated parenchyma cells.
- Redifferentiation – During dedifferentiation, meristems and tissues divide and produce cells again losing the capacity to divide, however mature to carry out specific functions. Example -woody tissues in dicotyledonous plants undergo redifferentiation

PLANT GROWTH REGULATORS

- Plant growth regulators are essentially hormones that control various functions related to the growth and development of the plant. They can be of two types, namely:
- Growth Inhibitors
  - abscisic acid
  - Benzoic acid
  - Salicylic acid
  - Coumarin
- Growth Promotors
  - Auxins
  - Gibberellins
  - Cytokinins

- **Plant Growth Promoters**
  PGRs that shows growth promoting activities such as cell division, cell enlargement, tropic growth, pattern formation, flowering, fruiting, seed formation, etc., are called plant growth promoters, e.g., auxins, gibberellins and cytokinins.

- **Plant Growth Inhibitors**
  These perform function in response to wounds and stresses i.e., of biotic and abiotic origin. These are also involved in various growth inhibiting activities like dormancy and abscission, e.g., Abscisic acid.
- The gaseous form of PGR, i.e., ethylene, can fit in either category and may function both as promoter and inhibitor. But largely it functions as an inhibitor of growth activities.

- Growth Inhibitors, as the name suggests, inhibit the growth of plants and induce dormancy. Growth Promoters promote flowering, the formation of seeds, cell division etc.

Thankyou