

Plant movement: Growth.

1. Discuss any four practical application of vernalization in agriculture and horticulture. (4 marks) (2080)

- Vernalization:

- Chilling or cold treatment given to the plant buds, seeds or seedlings for promoting early flowering.

- Consist many practical application in agriculture and horticulture.

- 4 practical applications of vernalization in agriculture and horticulture are:

i) Helps in shortening the vegetative period and bring about early flowering so that the crops can be harvested earlier.

ii) Increases the cold resistance of plants.

iii) Increases the resistance of plants to various diseases.

iv) Reduces the period between germination and flowering and so more than one crop can be obtained during a year in the same field.

2. What is seed dormancy? Write its types and importance in agriculture. (1+3=4 marks)
(2079)

Seed dormancy:

- State or condition in which seeds are prevented from germinating even when the seeds are subjected to favourable environmental conditions for germination.

Types of seed dormancy:

i. Seed coat induced dormancy:

- Caused due to hardness of seed coat.

- Hard seed coat prevents the entry of water, exchange of

gases, elongation of radicle and plumule.

ii. Embryo induced dormancy:

- Caused due to incompletely developed embryo.

- Freshly developed embryo needs certain periods of rest or fully developed embryo unable to resume growth.

Importance in agriculture:

i. Helps in the dispersal of the seeds during unfavourable environment conditions.

ii. Allows the storage of seeds for later use by animals and man.

iii. Dormancy induced by the inhibitors present in the seed coats is highly useful to desert plants.

3. Describe the different types of ^{tropic} nastic movements in plants. (4 marks)

- Types of nastic movements:

i) Locomotion movement:

- Movement of whole body materials within cell from one place to another place.

- Example: Cytokinesis, chromosomal movement during cell division.

ii. Geotropism:

- Movement of plant organs in response to land (gravity).
- Example: Roots are positively geotropic.

iii. Thigmotropism (Haptotropism):

- Movement of plant organs in response to touch.
- Example: Tendrils of pea plant coiled around support.

iv. Hydrotropism:

- Movement of plant organs in response to water.
- Example: Roots grows towards moisture on soil.

v. Chemotropism:

- Movement of plants part towards chemical stimulus.
- Example: Pollen tube grows in style due to presence of sugar.

vi. Phototropism (Heliotropism):

- Movement of plant organs in response to light.
- Example: Green shoots bend towards source of light.

4. Describe the different types of nastic movements.
(4 marks).

Nastic movement:

- Has no direction or directionless.

Types:

i. Hyponasty:

- More growth in lower side so, plant moves upward.
- Example: closing of flowers.

ii. Epinasty:

- More growth in upper side so, plant moves downward.
- Example: opening of flowers.

iii. Nutational Movement:

- Stem apices which occur in a zig-zag manner.
- Common in the stem apices which are not strictly rounded but slightly flattened.

iv. Circumnutational Movement:

- Strictly rounded apices,
- Growth occurs in a rotational way.