

PLANT BREEDING

The main object of plant breeding is to produce the new crop varieties superior in all aspects as compared to the existing types. This object is achieved by different methods of crop improvement as given below -

1. SELECTION

2. HYBRIDIZATION

3. PLANT INTRODUCTION AND ACCLIMATIZATION

4. MUTATION BREEDING

1. SELECTION →

- Primitive man to change his mode of life started growing crop.
- To grow a crop in the next season he has obtained seeds from the first crop. The unconsciously he might have practised the selection.

• It is the oldest breeding method. It is divided into two types -

Ⓐ Natural Selection →

- In nature the fittest can survive and rest wipe out.
- This has given the cultivated crop and "ecotypes" in plants.
- All the local varieties of crop are the results of such a selection.

Ⓑ Artificial Selection → Artificial selection is to choose certain individual plants

for the purpose of having better crop from a mixed population where the individual differ in characters.

Following methods are used for artificial selection —

(i) **Mass selection** → Similarly appearing first and most vigorous plants from the mixed population of a crop is selected.

- The selected plants are thread together and a mixture of seeds are obtained.
- The mixture so obtained is sown for raising the new crop from which the selection is made similarly in the next year.
- This process is repeated till the plants show uniformity in the desired characters and they constitute a new variety.

Merits →

- It is very easy, quick and simple method.
- It needs no exist extensive and large scale field trials.
- The varieties developed through mass selection are better adapted. It can be utilized in seed production also.

Demerits →

- It is not very suitable for improvement in characters having low heritability. It does not provide any chance for new recombination.
- The varieties developed by mass

selection is less attractive.

• In this method any female parent is considered for selection.

⑥ **Pure line Selection** → A pure line selection consists of progeny of a single self fertilized homologous plant and is used for developing varieties. A large number of single self-fertilized homozygous plants are selected and their progeny are growing separately in the field trials and single most valuable progeny as a new variety is saved.

Merits →

- The varieties are uniform and more attractive.
- The varieties can be easily identified during seed certification program.

Demerits →

- The varieties are less adaptable and less stable to environmental conditions.
- Total recombinations are not utilized.
- It takes more time.